U.S. Coast Guard Oceanographic Report

DEPARTMENT OF TRANSPORTATION

COAST GUARD

WEBSEC 71-72

AN ECOLOGICAL SURVEY IN THE BEAUFORT SEA

August—September, 1971-1972

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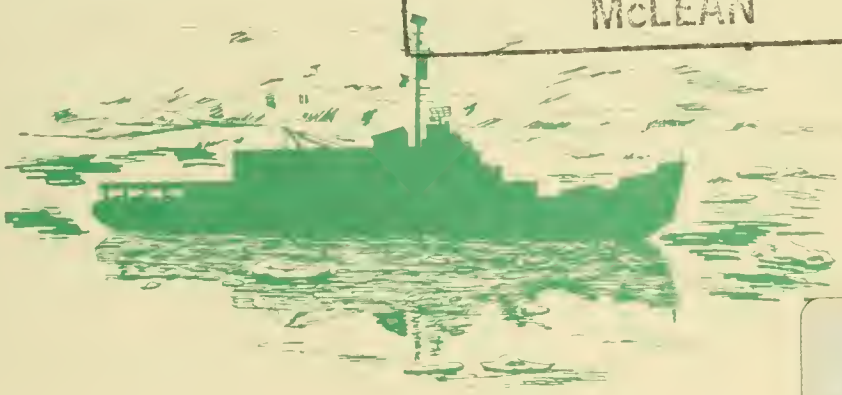

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WEBSEC 71-72

AN ECOLOGICAL SURVEY IN THE BEAUFORT SEA

August—September, 1971-1972

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Sept 1974
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ABSTRACT

This report contains a collection of scientific papers from two successive marine ecological baseline cruises to the Western Beaufort Sea (August-September, 1971 and 1972). Preliminary results of the physical, chemical, biological, and geological data are presented and interpreted. The results indicate that the data were collected in a marine ecosystem that is still in a relatively unpolluted state. The data should provide a base for assessing the affects of pollution from future development, especially from petroleum.

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Preface

WEBSEC-71 and 72 (Western Beaufort Sea Ecological Cruise—1971 and 1972) are a series of cruises to the Alaskan Arctic to survey the state of the marine environment and its associated biota. The main objective is to study the coastal waters of the Western Beaufort Sea with particular emphasis on the area near Prudhoe Bay. It is hoped that the physical, chemical, biological, and geological data acquired on these cruises will contribute to an understanding of the marine ecosystem in a relatively unpolluted state so as to provide a base for assessing the affects of pollution from future increases in resource development, extraction and transportation, especially from petroleum.

This oceanographic report is intended to be a compilation of the preliminary results and interpretations of WEBSEC-71 and 72. This data should provide a source document to be used as a basis for future research concerning the marine ecosystem of the Western Beaufort Sea.

Physical Oceanography of the Western Beaufort Sea

By

Gary L. Hufford, Scott H. Fortier, Daniel E. Wolfe,
James F. Doster, and Dennis L. Noble[1]

GENERAL DESCRIPTION OF STUDY AREA

Geography

The Beaufort Sea is the traditional name applied to the waters off the northern coasts of Alaska and Canada. It is an integral part of the Arctic Ocean and cannot be separated oceanographically. The Beaufort Sea extends from the Chukchi Sea on the west, to Banks Island of the Canadian Archipelago on the east. The northern limits are arbitrarily set as a line drawn from Point Barrow, Alaska to Cape Lands End in the Canadian Archipelago. The southern portion of the Sea overlies the continental shelf off the northern coasts of Alaska and Canada, which extends northward approximately 150 kilometers, and is generally shallower than 65 meters. It then drops off rapidly into the Canadian Basin, reaching a depth of 3940 meters in the Beaufort Deep (Fairbridge, 1966).

The coastal plain bordering the Beaufort Sea on the south, collectively with the foothills of the Brooks Range, is known as the Arctic Slope, or more commonly as the North Slope. Permafrost in this region penetrates the ground to a depth of 1100 feet (Thoren, 1959). The bordering coastal area has 6 rivers draining the North Slope into the Beaufort Sea. Antonov (1958) has estimated the total flow from these rivers to be 813 km^3/yr with greatest drainage occurring between May and October. The Mackenzie River (137°W) accounts for nearly 50% (430 km^3/yr) of the total flow. Along the coast of the North Slope exist many low gravel islands which constantly shift as the result of wave and ice action.

The Western Beaufort Sea Ecological Cruise (WEBSEC-71 and 72) surveys covered the southern portion of the Beaufort Sea from just east of Point Barrow (155°W) to Barter Island (143°W) extending northward to the 2000 meter isobath (fig. 1).

Ice

Investigations of the Beaufort Sea have been hampered by a heavy year-round covering of winter ice in offshore areas which may be grouped into two major categories: multi-year ice and first-year ice. Multi-year ice is ice that has survived the summer melt. It is usually fresher and stronger than first year ice. First-year ice forms in the many openings (polynyas, fractures, and cracks) which are scattered throughout the polar pack, as well as on open water found along the coast. This ice may be fragmented by the action of winds and surface currents to produce openings of various sizes. In addition, stresses on the pack ice can form pressure ridges that may exceed 30 feet in height when first formed. Along the coast these pressure ridges may exceed 40 feet or more with on-shore winds. (U.S. Navy Hydrographic Office, 1968).

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Ice distribution in the Beaufort Sea varies considerably from year to year as well as seasonally. The following description, summarized from H.O. 705 (U.S. Navy Hydrographic Office, 1968), represents mean conditions, but is of value since no major deviations where observed during 1971 and 1972.

The Beaufort Sea is covered with 7 to 8 oktas of ice for about 9 months of the year. There is usually some open water along the entire northern coast of Alaska in August and September. However, the heavy polar pack is never far off the coast and can advance onto the shore at any time. Northerly and westerly winds will force the pack against the shore while southerly and easterly winds hold the pack off the coast. During typical years, freezing starts in early October. By mid-October shore-fast ice extends along the length of the northern Alaskan coast with new ice formed or forming throughout the open water areas. By early November, 7 to 8 oktas of ice covers the entire Beaufort Sea. The new ice continues to grow and will reach a first year thickness of 1 to 2 meters by late spring. Breakup and melt begins in June near the mouths of rivers where warm river runoff flows over the sea ice. There is, in addition, some breakup in the Point Barrow region due to the intrusion of warmer water up through the Bering Straits.

Climate

The climate of the Beaufort Sea region and the Arctic in general is controlled by the heat budget. In the Arctic, the net annual radiation exchange is small since the summer gain is approximately balanced by the winter loss. However, heat reradiated from ice and open water areas combines with a far greater flux of heat which enters the area as a net annual northward horizontal transport by the atmosphere of excess heat received at the equatorial regions. This energy is radiated into space from the top of the atmosphere resulting in a net annual loss for the region.

Most of the year the surface of the Beaufort Sea is covered with ice reaching a thickness of 1 to 2 meters. This sea ice is sandwiched between two moving fluids (i.e., air and sea water) and is continually fracturing. The air over these fractures in winter may be as much as 50°C colder than the surface, resulting in the transport of large amounts of heat and water vapor into the atmosphere. With the exception of these fractures, little heat exchange occurs due to the insulating effect of ice and snow cover.

Sea level pressure gradients are weakest during the summer months in the Arctic, and circulation is usually poorly defined. The Beaufort Sea, however, is generally under the influence of a weak high pressure ridge. Circulation around this high results in winds from the east or northeast 50% of the time, and is usually of low velocity ($<$20 kts).

The character of the surface and distribution of the ice pack are more influential in determining the variation and extent of cloudiness than is the behavior of storm cells and frontal zones. In summer, the melting ice pack and associated low level temperature inversion cause the development of persistent stratus clouds and fog. The mean cloud cover is in excess of 80%. Absence of snow cover on land results in less stable lapse rates and diminishing cloudiness in near shore areas.

In summer the surface of the pack ice is essentially 0°C although melt pools reach slightly higher temperatures. In the Beaufort Sea therefore, above freezing air temperatures are found only over open water. But even here the air must remain near 0°C since the sea surface temperature does not rise much above the freezing point, and air temperature seldom differs greatly from that of the water. Warm air from inland is often transported considerable distances from the coast, but is cooled so effectively in the lower levels by contact with cold water or ice that a strong inversion forms. Near the immediate coast however, relatively high temperatures (17°C maximum) may be observed for short periods of time.

Precipitation on the North Slope and adjacent Beaufort Sea areas is scant ($<$12 cm/yr) and predominately in the form of snow. Defant (1961) estimates that 33% of the precipitation in the Arctic evaporates. The remaining 67% or 8 cm/yr when multiplied by the area in question would contribute $1 \times 10^{10} m^3$ of fresh water per year to the Beaufort Sea assuming no percolation due to permafrost. The maximum precipitation occurs in autumn and the minimum in winter, a cycle which is determined by the capacity of air to hold water vapor.

Oceanography

Oceanographic investigation of the Beaufort Sea from surface vessels has been limited to the coastal fringes owing to the presence of ice the year-around in the offshore areas. In favorable summers, large areas of open water appear along the north slope coast, particularly from Herschel Island (139°W) northeastward (U.S. Navy Hydrographic Office, 1956). These large ice free areas are most likely the result of relatively warm river overflow from the North American mainland melting the sea ice (Sater, 1969). The physical properties of the open water areas are fairly well defined (U.S. Navy Hydrographic Office, 1954, 1956, 1963; Marine Science Center, 1968).

Investigation of the ice-covered deep Basin of the Beaufort Sea has been primarily from drifting ice stations (Flectcher's Ice Island, T-3; Arlis I and II; and Russian drifting stations). Some data has been collected by aircraft ice landings (Skijump I and II).

Results of all the data from the Beaufort Sea reveal three major water masses: Arctic Water (0-200 m); Atlantic Water (200-900 m); and Arctic Bottom Water (900 m-bottom). These water masses generally fit the classical description by Nansen (1902) with some qualification due to local climatological fluctuations, advections, and mixing. These factors are reflected in the broad range of temperatures (at or near the freezing point to 3.0°C) and salinities (3.0 to 32.0‰) reported for the surface layer (0-40 m) in the summer and for the lower temperatures in the core (0.3-0.5°) of the Atlantic layer.

Sverdrup (1956) estimated that about two meters of ice is formed in the Artic in the winter with about one meter of ice melting in the summer. He assumed that the difference between ice formation during the winter and icemelt in the summer is compensated by net drift of ice out of the region. This assumption may not hold for the western Beaufort Sea because of irregular currents, unknown amounts of fast ice along the coast, variable winds, and variation in heat from river runoff. However, the irregular presence of icemelt will cause variation in the surface temperature and salinity. Sater (1969) indicated that in the northern Beaufort Sea icemelt can mix to some extent with the underlying sea water through differential movement of ice and by wind mixing in ice-free areas, but icemelt rarely decreases the surface salinity to below 28.0‰.

In the southern Beaufort Sea, river runoff becomes an important factor affecting the surface temperature and salinity, especially between May and October. This area is characterized by a broad (avg. 40 km), shallow continental shelf (less than 65 m) having a large surface area in relation to its total volume. The combined river runoff received by this area with its large surface to volume ratio influences surface water conditions in the sea. Antonov (1958) estimates that the land drainage of North America flowing into the Arctic excluding the Yukon River is 813 km^3/yr. (The drainage of the Yukon is estimated to be 240 km^3/yr. However, most of this water becomes mixed with Pacific water to form a major part of the Alaskan Coastal Current in the northern Bering Sea and Chukchi Sea (Saur et al., 1954), and in this paper it will be considered as a component of the total flow through the Bering Strait entering the Arctic). Along the continental shelf of the North Slope, river runoff together with icemelt can cause surface water temperatures as high as 3.0°C and surface salinities as low as 3.0‰.

The influence of Pacific water on the characteristics of Arctic Water in the Beaufort Sea seems to be threefold: a subsurface temperature maximum (75 m), a minimum (160 m) and a near surface temperature maximum. Coachman and Barnes (1961) found a subsurface temperature maximum at 75-100 meters depth in the Beaufort Sea and attributed its existence to advection of Pacific water through the Bering Strait. The temperature maximum is best developed due north of the Chukchi Sea and decreases in temperature as it travels around the Beaufort Sea anticyclonic gyre.

A thin layer exists at about 160 meters in ArcticWater that is characterized by a temperature minimum (−1.4 to −1.5°C) and a nutrient maximum ($PO_4 > 1.8$ μg-at/l, $NO_3 > 17$ μg-at/l). Kinney et al. (1970) suggest that this layer is due to Bering Sea winter water.

Intrusion of relatively warm (>0°C) Pacific water in the shelf waters of the western Beaufort Sea has been reported (Johnson, 1956). This water is 2 to 4°C warmer than the Pacific water at

75 meters depth farther offshore. The relatively high temperatures suggest that the warm water must flow around Point Barrow from the Chukchi Sea, then directly eastward rather than around the gyre of the Beaufort Sea. Fluctuations in the eastward extent of this warm Pacific water have been observed. Johnson (1956) noted that the eastward flow of Pacific water was more pronounced in 1951 (to 143°W) than in 1950 when its most apparent extension east was only to the Colville River (151°W).

Data from the deep Beaufort Sea (below 200 m) taken over many years and during all seasons from ice islands (Coachman, 1968) show a remarkable regularity in the vertical distribution of temperature and salinity. According to Coachman (1968) this implies that a steady state condition exists and that the distribution of observed properties within the Arctic basin is the result of continuing processes within the basin. In general the deep waters of the Beaufort Sea are composed of the following water masses: (1) Atlantic Water (200-250 meters down to 900 meters) and (2) Arctic Bottom Water (900 m to bottom). Atlantic Water is characterized by above zero temperatures (0 to 0.5°C) and uniform salinities (34.5 to 35.0‰). Coachman and Barnes (1961) show the origin of this water mass to be advection through the Norwegian Sea. Arctic Bottom Water is characterized by temperatures below 0°C (−0.3 to −0.4°C) and uniform salinities in the range of 34.93 to 34.99‰. Coachman and Barnes (1961) state that this water mass originates in the Norwegian Sea in the winter; however, a small contribution comes from the marginal seas in the Arctic.

The classical account of Nansen (1902) and the recent studies of Coachman and Barnes (1961) of the three basic water masses of the Arctic Ocean are slightly modified for the Beaufort Sea. The boundaries between the three main water types are not as clearly defined in this area as in other parts of the Arctic. The Atlantic layer has lost much of its unique characteristics of temperature and salinity due to mixing but here also Pacific water intrudes between the Arctic upper layer and Atlantic layer. For this reason, there has been a tendency to further subdivide the waters of the Beaufort Sea. This has resulted in considerable confusion in the literature owing to vague definitions and names given to the intermediate water masses. Rather than confuse the reader by listing the many classifications (e.g., Kusunoki et al., 1962) it will suffice to say that in this paper the classical approach will be adhered to. A discussion of the processes that have affected the three water masses in the southern Beaufort Sea will be given in a later section (Distribution of Measured Properties).

The surface circulation of the Beaufort Sea has been derived from summer surface vessel cruises, ice movement, drift of ice islands, and distribution of observed water properties. A generalized chart from the U.S. Navy Hydrographic Office (1956) showing the prevailing surface currents in the Beaufort Sea is presented in figure 4. In general, the surface waters have a clockwise (anti-cyclonic) movement, apparently resulting from the general wind pattern (Sater, 1969). The center of the gyre (80°N, 140°W) coincides with the center of the mean atmospheric pressure anticyclone (Campbell, 1965). The currents can show great irregularities and wide day to day variations. Surface current velocities vary from 0 to 10 cm/sec in the northern Beaufort Sea (Tripp, 1966). However, under great irregular wind stress current speeds of up to 30 cm/sec have been recorded (Kusonoki et al., 1962). A marked increase in surface current speed occurs in the northern Beaufort Sea in the summer or fall (Coachman, 1969). This surge occurs in the late summer west of 140°W and not until late fall in the eastern part of the gyre. The fastest surface currents seem to occur in the southwest region of the Beaufort Sea near Point Barrow, Alaska (U.S. Navy Hydrographic Office, 1963) where current speeds of 20 cm/sec are common.

Movement of the deeper waters in the Beaufort Sea has been inferred from indirect evidence and two conflicting patterns have been reported. Timofeyev (1957) suggested a general cyclonic (counter clockwise) flow for the Atlantic Water in the entire Arctic Ocean. The flow pattern is inferred from a study of the heat content of the layer. Worthington (1953, 1959) has suggested a different circulation pattern for Atlantic Water in the Beaufort Sea: anticyclonic flow similar to the surface layer. This flow pattern is based on an ex-

amination of the temperature structure of the deep waters. Coachman and Barnes (1963), using the "core-layer method" of Wust (1935), were able to support Worthington's circulation of Atlantic Water in the Beaufort Sea. The only satisfactory resolution to the movement of Atlantic Water in the Beaufort Sea will be through numerous direct current measurements.

Direct current measurements from T-3 ice island at 150 m (pycnocline), 500 m (core of Atlantic layer), and at 1300 m (Arctic Deep Water) indicate that the flow is quite similar in the three water masses and that the dominant mode of motion is barotropic (Coachman, 1969). The current speed varied between 0 and 8 cm/sec.

The Beaufort Sea, like the rest of the Arctic, seems to be a well aerated basin with a good supply of dissolved oxygen (greater than 70% saturation at all depths) (Coachman and Barnes, 1963; Sater, 1969). Concentrations of dissolved oxygen in the Beaufort Sea have not been measured routinely so that a detailed description can not be given for most of the region. Kinney, et al. (1970) are the first to elucidate the detailed vertical oxygen structure of the water column in the northern Beaufort Sea from Fletcher's ice island (T-3). They found that the most striking feature of the oxygen profile other than the high surface values (>8.0 ml/l) was an oxygen minimum (6.0 ml/l) at 200 meters depth, about 50 meters below the nutrient maximum. Kinney, et al. (1970) speculate that the oxygen minimum is partially due to advection processes rather than in situ oxidation alone. Kusunoki et al. (1962) found a minor maximum (6.9 ml/l) at 800 meter depth in the southern Beaufort Sea. This water was 85% saturated. Below this level the oxygen content decreases gradually toward the bottom where the value was about 6.5 ml/l (81%). It is interesting to note that Kusunoki et al. (1962) observed slightly higher dissolved oxygen concentrations at depths below 250 meters during the winter than in the summer, particulary at levels between 500 to 1300 meters. This suggests that one might be able to observe subtle seasonal fluctuations in the Atlantic layer.

Recent work in the Arctic indicates that concentrations of nutrients are low in the surface waters as well as in deep waters and do not vary appreciably throughout the year in the surface water (Kawamura, 1967). Studies by McGill University (Marine Science Center, 1968) show that high nutrient concentrations are associated with the Pacific water layers at 75 meters depth and 160 meters depth in the Beaufort Sea. Kinney et al. (1970) found the nutrient maximum at 160 meters to be associated with the temperature minimum in the northern Beaufort Sea. Below this layer, nutrient concentrations continue to decrease to about 1500 meters and remain relatively constant to the bottom of the northern Beaufort Sea. Little is known about the nutrient distribution in the southern Beaufort Sea or the role of the rivers as a source of supply of nutrients. Kusunoki et al. (1962) observed relatively high silicate concentrations (>15μg-at/l) in the surface waters just north of Point Barrow and suggested that the concentrations may be due to river runoff or from Pacific waters passing through the Bering Strait.

RESULTS OF WEBSEC-71 AND 72

Data Collection and Processing

WEBSEC-71 was conducted from the USCGC GLACIER (WAGB-4) and RV NATCHIK in the western Beaufort Sea during 17 August to 20 September, 1971. From the GLACIER seventy-two stations were taken in the vicinity of Barter Island to Cape Halkett (fig. 2). Physical and chemical oceanographic data were collected at these stations from 48 Nansen bottle casts, 21 STD'S (salinity-temperature-depth recorder), 163 expendable bathythermograph (XBT) drops, and 5 current meter lowerings. Forty-five Nansen bottle casts were taken from the NATCHIK (fig. 2).

WEBSEC-72 was conducted from the USCGC GLACIER and RV NATCHIK in the western Beaufort Sea during 2 August to 12 September, 1972 (fig. 3). Physical and chemical oceanographic data were collected on the GLACIER at seventy-two stations from 94 Niskin bottle casts, 21 STD's, 60 expendable bathythermograph (XBT) drops and 63 current meter lowerings. Forty-five hydrographic stations were taken by the NATCHIK.

Temperature

Water temperature data were obtained by use of Bissett-Berman model 9006 (1971) and 9040 (1972) STD underwater sensor units, paired reversing thermometers attached to Nansen and/or Niskin bottles, and by XBT's calibrated with bucket thermometer readings.

Salinity

Water samples were drawn from Teflon lined Nansen and/or Niskin bottles for salinity determinations conducted on board with inductive salinometers. The salinities were calibrated with standard (Copenhagen) water at least once per 30 samples. Conductivity values obtained were converted to salinity values by use of the International Oceanographic Tables published jointly by UNESCO and the National Institute of Oceanography of Great Britain (UNESCO, 1966). Salinity determinations were also made in situ with the STD sensor unit.

Dissolved Oxygen Concentrations

Water samples were drawn from Teflon lined Nansen and/or Niskin bottles for shipboard analysis of dissolved oxygen by means of a modified Winkler titration (Strickland and Parsons, 1968). Values of percent saturation were computed utilizing a computer program based on tables of oxygen saturation developed by Green and Carritt (1967).

Dissolved Nutrients

A Technicon AutoAnalyzer R Model I was employed in carrying out analyses for dissolved nutrients. The resulting extinction values were converted to concentrations, in microgram-atoms/liter, taking into account the salt effect. The nitrite procedure is based on the manual procedure of Bendschneider and Robinson (1952) with absorbance being measured at 520 nm. The nitrate procedure is based on an automated version of the manual procedure of Wood, Armstrong, and Richards (1968), differing in that absorbance is measured at 520 nm. Molybdate complexes of phosphate and silicate were reduced to form colored complexes. The silicate procedure is based on the automated method of Armstrong, Stearns, and Strickland (1967) except that a slightly different sample and diluent tube size are used and absorbance is measured at 815 nm. The phosphate procedure is that of Jadamec, Hufford, and Fortier (unpublished manuscript) which utilizes an ascorbic acid-antimony reducing agent and measures absorbance at 700 nm.

Currents

Direct measurements of currents were made from the CGC GLACIER at the surface, 20 meters, and near bottom while at anchor at 5 stations during WEBSEC-71 (fig. 2). Hydroproducts model 501 and Geodyne model 102 recording current meters were used and were allowed to run for periods ranging from 6 to 24 hours. Strip charts from the Hydroproducts meters were digitized by hand yielding data points at 3-½ minute intervals. Calibration corrections were applied to the speed, and corrections were also made for magnetic variation and direction. The data were processed to yield vector averages of 15 minutes and give progressive vector diagrams. The photographic records from the Geodyne current meters were processed by machine yielding data points at 1 minute intervals. The data were also processed to give 15 minute and overall vector sums. A total of 62 short term currents measurements using Geodyne 102 current meters was made from the vessel during WEBSEC-72. An anchored current meter array with two Geodyne 102 current meters (one at 25 meters, the other at 50 meters) was placed on the continental shelf just east of Point Barrow, Alaska for 36 days and subsequently recovered (fig. 3). Processing of the data was done by EG&G Company of Waltham, Massachusetts.

Meteorological Observations

Surface meteorological observations were made at 3-hour intervals and on each station. Upper air observations were not taken due to a lack of sufficient personnel.

Quality Control

Initial quality control of all physical and chemical oceanographic data was performed on board

USCGC GLACIER, and final control was conducted at the Coast Guard Oceanographic Unit. All of the oceanographic data were submitted to the U.S. National Oceanographic Data Center (NODC) for archiving and further processing. NODC listings of the processed data have been included in this report (Appendix A).

DISTRIBUTION OF MEASURED PROPERTIES

Ice conditions encountered between Point Barrow and Barter Island during WEBSEC-71 and 72 (figs. 5 and 6) were the same as the average conditions suggested in the literature (U.S. Navy Hydrographic Office, 1968) and this allowed for relatively easy penetration into the desired operating area. During WEBSEC-71, the average ice conditions between the main pack edge (generally north of 71°N) and the 10 fathom (18 m) isobath were 2-3 oktas. During WEBSEC-72 much more open (ice free) water was encountered in the eastern and western sections of the survey (fig. 6). Off Prudhoe Bay (middle of survey area) ice concentrations of 6-8 oktas were present near the coast during the entire length of the cruise. Ice concentration, of course, influenced the location of individual stations (figs. 2 and 3), and in most cases the vessel was maneuvered onto a station that offered minimal ice concentrations for that area. Winter freezing began near the end of the observation period with noticable amounts of new ice forming on the sea surface, especially near the pack.

The distribution of water properties (figs. 7-26 and 32-97) in the western Beaufort Sea during August-September, 1971 and 1972, was generally similar to conditions observed or suggested in the past: three major water masses (Arctic Surface Water, Atlantic Water, and Arctic Bottom Water, (figs. 7 and 8) fitting the classical description of Nansen (1902) but with some modification due to local climatological fluctuations, advection, and mixing.

Arctic Surface Water (0 to 200 Meters)

During the summer, the surface waters in the western Beaufort Sea are affected by ice and icemelt, river runoff, surface winds and solar heating, and currents from the Bering Sea. As an example, these factors are reflected in the broad range of temperatures (1971: −1.2 to 3.2°C, 1972: −0.7 to 4.7°C) and salinities (1971: 3.92 to 30.00‰, 1972: 4.04 to 30.00‰) observed in the near surface waters during WEBSEC 71 and 72 (figs. 9-20, 44-45, 50-51, 62-63, 74-75, 86-87, and 92-93). Generally the very low surface temperatures (<0°C) were found offshore near the ice pack. Except for one value (STA. 15, 1971) all the low temperatures were at least 0.2°C above their freezing point (fig. 31). Sea surface temperatures in open water areas were more dependent on direct heating from the sun (i.e. time of day, cloud cover) and advection. Low surface salinities (<28‰) were generally associated with low surface temperatures and salinity was influenced significantly by the proximity and concentration of ice and icemelt. Salinity values between 4-20‰ were found in areas of heavy ice (6-8 oktas) while ice concentrations of less than 3 oktas usually reduced surface salinity to only 20-26‰. With the spotty ice cover during WEBSEC-71 (fig. 5), low temperatures and salinities could be found scattered throughout the survey area. It was found best to treat any given surface temperature and salinity as representative only of its sampled spot.

The dissolved oxygen concentrations in the surface water were significantly higher (>8.5 ml/l) in the vicinity of and under the ice pack (figs. 21-26, 46, 52, 64, 76, 88 and 94) probably reflecting the greater solubility of dissolved oxygen in colder waters. The ice pack may also act as a barrier of air-sea interaction. In 1971, dissolved oxygen concentrations in the surface waters were generally higher (8.2 to 9.9 ml/l) than in 1972 (7.3 to 9.9 ml/l) with supersaturation common. This seems to be due in part to the presence of more open water in 1972 than in 1971 and to the presence of a warm water mass at the surface in the western area of the survey during 1972.

Surface nutrient (PO_4, NO_3, SiO_3) values seemed to be affected by the presence of ice (figs. 38-43, 47-49, 53-55, 65-67, 77-79, 89-91 and 95-97). Many of the low nutrient concentrations occurred in the melt water (salinity <20‰) near

the ice pack. Some low surface values were found scattered throughout the survey area in open water so that a given surface nutrient value should be considered representative only of its sampled spot.

According to Antonov (1958) an average of 813 km^3/yr (excluding the Yukon River) of river water flows into the Arctic Ocean from the North Slope rivers of North America; most of the flow occurs between May and October. Because the broad shelf area of the southern Beaufort Sea is comparatively shallow (<65 m), the shelf water has a large surface area in relation to its total volume. This makes the combined river discharge received by the southern Beaufort Sea an important factor in affecting the distribution of surface temperatures, salinities, dissolved oxygen, nutrients, and ice.

Relatively high surface temperatures (0.0 to 3.2°C) and low salinities (3.9 to 22.0‰) found along the coast during WEBSEC-71 are probably indicative of river runoff (figs. 9 and 15). The extent of most of the river effluent plumes from the Colville (151°W), Kuparik (149°W) and Sagavanirktok (148°W) seems to be limited to less than 4 km from the river mouths. It is interesting to note that the small plumes seem to be better defined by temperature than salinity. This condition may indicate that river water is relatively very warm but low in total volume for this time of year.

A river effluent plume was observed in the eastern section of the WEBSEC-71 survey area (figs. 9 and 15). This plume was characterized by temperatures of 0.0 to 1.8°C and salinities of less than 20‰: the lowest surface salinity being 3.92‰ at station 6. This plume is probably due to the MacKenzie River, the largest source of freshwater drainage (430 km^3/yr, Antonov, 1958) in the North Slope area. The MacKenzie River is located east of the survey area at 137°W, suggesting a westward distribution of the river plume.

The horizontal distribution of river effluent in the open sea seems to be governed by a combination of offshore circulation and local prevailing winds (Budinger et al., 1964). These two processes appear to be affecting the distribution of the MacKenzie River plume described above; however, their relative importance is unclear. The existence of a net westward flowing surface current along the slope of the Alaskan coast has been discussed (Worthington, 1953; Kusunoki et al., 1962); however, there is a lack of direct measurements on the velocity of the current. The prevailing winds in the eastern survey area were from the N-NE during the WEBSEC-71 (fig. 27) with recorded wind speeds of generally 1 to 16 knots. Although the wind observations are not synoptic, a good correlation appears to exist between wind direction and the apparent distribution of river effluent. The combined effect of the wind and current would influence the river effluent distribution toward the west supporting the hypothesis that the plume is primarily due to the MacKenzie River.

River effluent plumes along the north slope were poorly developed during WEBSEC-72. Helicopter overflights with infrared photography indicated that the plumes were located only 2 miles or less offshore and that the longest extension of the plumes was parallel to the shore and towards the east on the Canning, Sagavanirktok, Kuparuk, and Colville Rivers. Possible reasons for the lack of large river effluent plumes during WEBSEC-71 and 72 are: (1) low river runoff for this time of year (August-September); (2) icemelt masking the presence of some of the larger river plumes along the coast; and (3) inadequate sampling near the river mouths.

Only a few measurements of nutrient concentrations were made in the plumes during 1971 and 1972 because of inadequate space on the RV NATCHIK for instrumentation and sample storage. In 1971 nutrient samples collected along the coast indicated that the river plumes were phosphate free but contained small concentrations of nitrate (1-3 μg-at/l) and silicate (2 μg-at/l).

During 1972, nutrient samples were collected above the estuaries in the Canning, Sagavanirktok, Kuparuk, and Colville Rivers. Phosphate concentrations were near zero or below detection limits. Nitrate and silicate concentrations were higher than in the coastal waters except off the mouth of the Colville River (table 1).

In the summer, a strong stability exists in the surface water layer due to an increase of temperature (solar heating) and a decrease in salinity (icemelt, river runoff). It would necessitate a very powerful wind to destroy the stability and cause mixing to deeper waters. Past reports indicate that in the summer, surface winds rarely exceed

Table 1.—Average nutrient concentrations (μg-at/l) in the North Slope rivers and icemelt from the Beaufort Sea

	PO_4	NO_3	NO_2	SiO_3
Colville	TR*	12.4	0.30	9
Kuparuk	0.0	15.3	0.20	7
Sagavanirktok	0.0	18.6	0.24	10
Canning	0.0	4.2	0.23	25
Icemelt	0.0	0.1	0.00	0

*Trace Amount

20 kts in the southern Beaufort Sea (U.S. Navy Hydrographic Office, 1968).

During WEBSEC-71 and 72, surface winds exceeded 20 kts only five times and then only for a period of a few hours (figs. 27-28). The effects of wind mixing on the surface waters seemed to be limited to the upper 30 meters of the water column (figs. 32-37, 44-55, 62-67, 74-49, 86-97). Low surface salinities (<28°/oo) in the ice-free areas indicate poor wind mixing. Sater (1969) states that surface salinities in ice-free areas should rarely be less than 28°/oo because of wind mixing of icemelt or river runoff with underlying sea water. Variations in the surface wind field during 1971 included two periods of moderate (up to 25 kts) winds (September 1-5, STA's 46-58: and September 13-16, STA's 86-93) separated by periods of relative calm (<10 kts) (fig. 27). Both moderate wind periods were associated with a decrease in barometric pressure (fig. 29).

Surface air temperature did not show any clear trend toward decreasing values during the length of the 1971 cruise (fig. 29). The largest temperature change observed was 6° (−3.0 to 3.0°C). The coldest surface air temperatures (<0°C) were associated with NW to NE winds, while the warmest values are associated with southwesterly winds. Some variation in air temperatures during any period of the cruise probably results from varying proximity to the edge of the ice pack.

Variations in the surface wind field during WEBSEC-72 are not as detailed due to the lack of data but trends are still discernable (fig. 28). Wind speeds were again less than 20 kts and predominantly from the NE except for two periods of moderate winds (August 8-10 W-SE, STA's 12-17, September 12, W-NW, STA's 60-61) where speeds up to 25 kts were measured. An increase in barometric pressure occurred during both periods. Warm surface air temperatures were associated with the W-SW winds whereas cold surface air temperatures were associated with the W-NW winds.

Surface air temperatures showed a trend toward decreasing values during the 1972 cruise (fig. 30). There were two periods of warming (August 19-22, September 2-5) though the latter was not as high in temperatures. Air temperatures were generally much higher (−2 to 10°C) in 1972 than in 1971 (−3 to 3°C).

Below the summer convective layer, a subsurface temperature minimum (−1.1 to −1.5°C) layer of 5 to 10 meters thick was observed at many of the northern and eastern stations taken during WEBSEC-71 and 72 (figs. 32 and 33). The minimum layer was found from 15 meters to 40 meters depth. Salinities associated with the temperature minimum ranged from 30.1 to 32.2°/oo (fig. 35). This cold layer situated between the warmer upper and lower layers forms a dischothermal temperature stratification that is probably due to a limitation of the convective process and is unaffected by depth of water. Defant (1961) states that if salinity is not nearly constant at all depths of the water column, the convective processes in the autumn and winter will not be able to extend to the bottom. With the onset of spring, heating of the surface layer begins and gradually extends to greater depths during the summer. However, if summer heating is not as intense as winter cooling, then a cold intermediate layer if formed and can be interpreted as the remainder of the convectional flux extending to the depth during the winter. Thus the depth of convectional penetration in winter of the western Beaufort Sea is, in general, limited to less than 40 meters.

The temperature minimum layer was evident in the eastern area of the western Beaufort Sea throughout the length of the 1971 and 1972 cruises, indicating that the layer exists throughout the summer (figs. 50, 86, and 92). The absence of the layer in the western section of the survey area is probably due to advection of a warm layer into the area. This warm layer will be discussed in a later section.

The presence of Bering Sea water in the Beaufort Sea has been discussed by Treshnikov (1959), Coachman and Barnes (1961), and Kinney et al. (1970). Bering Sea water can be found in two separate layers: one at 75 meters depths, (due to Bering Sea summer water and characterized by a temperature maximum) and the other at 150 meters depth (due to Bering Sea winter water and identified by a subsurface temperature minimum).

A possibility for a third existence of Bering Sea water in the western Beaufort Sea was first indicated by Johnson (1956). He described a relatively warm (<0°C) near-surface water mass that contained Bering Sea planktonic forms. The water mass extended to 143°W in the Beaufort Sea. There have been no other reports on this possible third presence of Bering Sea water in the Beaufort Sea.

A major feature of the distribution of temperature in the near-surface waters of the western Beaufort Sea during WEBSEC-71 and 72 was the presence of a relatively warm (1971: 0.1 to 5.0°C; 1972: 0.0 to 7.5°C) water mass (figs. 44, 50, 62 and 74) similar to the warm water reported by Johnson (1956). Salinity, dissolved oxygen, and nutrient concentrations of the warm layer in 1971 were similar to adjacent water and could not be used to identify the layer (figs. 45-49, 51-55). The horizontal distribution of the warm water was traced from 143°42′W (0.1°C) to 154°30′W where the warmest temperature (5.0°C) was recorded (fig. 98). The water mass extended from the 25 meter bottom contour on the continental shelf north to at least 71°40′N, the northern boundary of the survey area.

A time series study was conducted at station 90 during WEBSEC-71 to examine temporal variations in the warm water mass. The results are given in table 2. The core of the warm water exhibited an increase in temperature (0.16°C) and decrease in salinity (0.425°/oo) over a 10.5 hour period.

An XBT (Expendable Bathythermograph) transect was taken for 9 hours along 71°21′N from 153°00′W to 154°30′W during WEBSEC-71 to study the spatial distribution of temperature in the warm water mass (fig. 100). The warm water was found from 10 meters depth to as deep as 60 meters depth with an average thickness of 25 meters. The upper and lower boundaries of the water mass seem to be indicated by the 0°C isotherms. The horizontal distribution of temperature showed fluctuation in the heat content along the core.

In 1972, the warm water layer was found from the surface to 75 meters depth except for station 64 where the layer was found to a depth of 125 meters. The warm water layer was traced from 147°00′W to 153°40′W (fig. 31). Again the warm layer extended from the 25 meter bottom contour on the continental shelf to at least 71°40′N, the northern boundary of the survey area.

The dissolved oxygen concentrations (<8.0 ml/l) in the warm layer in 1972 were significantly different then adjacent waters (>8.5 ml/l) (figs. 64, 76, and 88). Concentrations of 6.5 to 7.0 ml/l were found in the core of the layer. These low concentrations are not only due to the lower solubility of dissolved oxygen in the warmer waters but probably also due to some oxygen utilization as seen in the saturation values

Table 2.—Time-series study of the warm water mass at 71°07′N, 153°00′W, during September 15-16, 1971.

Time (GMT)	Station (No.)	Depth of Core (m)	Temp. (°C)	Sal. (°/oo)	Oxygen (ml/l)	Current Speed (cm/sec)	Current Direction (°T)
1944	90 A	20	1.22	31.097	8.44	24	147
2207	B	15	1.25	31.001	8.44		
0000	C	15	1.31	30.916	8.34	24-4	
0209	D	15	1.32	30.840	8.39		
0400	E	15	1.34	30.789	8.39	4-16	077
0621	F	15	1.38	30.672	8.32		

(<97%) for the layer compared to adjacent waters (>100%) (fig. 103).

A T-S analysis was attempted to determine the source of the warm water mass. Because of its relatively warm, saline properties, a hypothesis was tested that the origin of the water mass is the Bering Sea—Chukchi Sea. T-S data (surface to bottom) from the Bering Strait (Husby, 1971; Husby and Hufford, 1971) and the Chukchi Sea (Ingham et al. 1972) were compared to the T-S data from the western Beaufort Sea (WEBSEC-71) (fig. 101). It is significant to note that the sigma-t of the warm water mass lies in the range of 23.7 to 25.7, the same as the sigma-t range of the near surface waters of the Bering Sea—Chukchi Sea.

The minor temperature maximum (−.8 to −1.2°C) found at 75 meters in the northern Beaufort Sea (Coachman and Barnes, 1961) does not seem to be developed in the survey area of WEBSEC-71 and 72. The absence of the maximum in the western Beaufort Sea is probably due to mixing with surrounding waters and/or the presence of the warm water mass (described above) masking the feature. The western Beaufort Sea is at the farthest distance from the source of the temperature maximum (northern Chukchi Sea) because of circulation patterns. The maximum has been shown to decrease in temperature from the northern Chukchi Sea as it flows around in the Beaufort Sea anticyclonic gyre (Coachman and Barnes, 1961).

A subsurface temperature minimum (−1.4 to −1.6°C) was observed at 130-150 meters depth during both WEBSEC-71 and 72 (figs. 32 and 33). This minimum corresponds to the minimum described by Coachman and Barnes (1961) and Kinney et al. (1970) and is attributed to advection of Bering Sea winter water. Relatively high nutrient concentrations (PO_4 >1.6, NO_3 >12, SiO_3 >30 μg-at/l) were associated with the temperature minimum (figs. 38-43).

The layer from 150 m down to 250 m (upper boundary of the Atlantic Water) has properties (except dissolved oxygen) intermediate between those of the subsurface layers and Atlantic Water (figs. 32-43). These intermediate values result from mixing of the subsurface and Atlantic layers. Since these layers are in more or less continuous supply there is a quasi-steady state distribution of the properties at this level.

A dissolved oxygen minimum (<6.0 ml/l) was observed at 200 m, fifty meters below the nutrient maximum (figs. 36 and 37). This feature has been observed in the northern Beaufort Sea by Kinney et al. (1970), and they suggest that it is partially due to advection processes rather than in situ oxidation alone. Source of the advection is unknown. It is noted that the oxygen minimum corresponds to a sharp change in the thermocline (figs. 32 and 33).

Atlantic Water (250 To 900 m)

The middle layer of the three layered system in the Arctic Ocean consists of Atlantic Water which enters through the strait lying between Spitsbergen and Greenland and than occupies the level between 250 and 900 meters (Cochman, 1963). The water mass is characterized by relatively high temperature (>0°C) and salinities of 34.6 to 35.0‰.

During WEBSEC-71 and 72, Atlantic Water (0.00 to 0.48°C, 34.6 to 35.0‰) was found at depths from 250-300 meters down to 900 meters (figs. 32-35). The upper and lower boundaries are indicated by the 0°C isotherms (figs. 56-61, 80-85) with the maximum temperature (0.44°C, 1971; 0.48°C, 1972) found at the core (400 to 450 m). The temperature gradients on the upper side of the layer are much steeper than on the lower side, suggesting that loss of heat from the layer is not the same across the upper and lower boundaries. The most striking feature of the Atlantic Water was the uniformity of temperature and salinity in the core from station to station. Assuming a uniform decrease in temperature and salinity along the core it appears that the layer has retained approximately 15% of its original characteristics exhibited upon entrance into the Arctic Ocean. This percentage fits the value found by Coachman and Barnes (1962) for Atlantic Water in the northern Beaufort Sea.

The dissolved oxygen concentration of the Atlantic layer is greater than 6.0 ml/l (>70% saturation) exhibiting a slight maximum (6.8 ml/l) at 600 m and then decreasing slightly (6.7 ml/l) to 900 m (figs. 36 and 37). Nutrient con-

centrations which have shown a maximum at 150 m in the subsurface waters show a general decrease in concentration to 500 m, then remain fairly constant to the bottom (figs. 38-43).

Arctic Bottom Water (900 m–Bottom)

From the bottom of the Atlantic layer down to 2000 m there occurs a steady though slight decrease in temperature (0.00 to −0.43°C) while salinity (34.97 to 35.01‰) remains virtically the same (figs. 32-35). Dissolved oxygen concentration is 6.4 to 6.8 ml/l. Saturation is everywhere greater than 80%, indicating a well aerated basin (figs. 36, 37, 102, and 103). Because of the arbitrary restriction to remain inshore of the 2000 m bottom contour, no detailed study of this water mass was attempted.

Currents

Direct current measurements were taken at five stations during WEBSEC-71; observation levels, water depth, length of observation and station number are indicated in table 3. The records revealed a layered system in which surface currents varied significantly in direction and magnitude from the more coincident mid-level and bottom currents. Figure 2 details the geographical location of the current meter arrays.

The data from the hydroproducts current meters were digitized and vector averaged over 15 minute intervals prior to final vector summing for presentation in figures 104-108. Similar procedures were used in analyzing data from the geodyne system with initial averages extended over a one hour period.

While occupying all current meter stations during WEBSEC-71, the motion of the vessel swinging at anchor introduced significant variation into the recorded velocities. Operating procedures were such that the current meter arrays had to be suspended from the vessel when at anchor. Magnitude of these variations can be estimated at station 23 by examining a log of the vessel's headings which was recorded at 15 minute intervals for a 20 hour period. These records showed that the vessel moved through a maximum arc of 123° during the full period, and through an average arc of 9.8° in 15 minutes. Assuming uniform motion during a 15 minute period, a swing of 9.8 would produce a recorded velocity of 0.058 kts. at right angles to the vessel's heading. The maximum swing during any 15 minute period was 58° which introduced a velocity of 0.35 kts. Examination of the average current speed indicates that the 0.058 kts. induced by the vessel motion is often equal to or greater than the information recorded on the current meter strip charts. Obviously, instantaneous or 15 minute averages are rendered nearly useless by such motion. Only the trends revealed by long-term vector averages (figs. 104-108) can be considered significant under these circumstances.

Table 3.—Direct current measurements taken at five stations during WEBSEC-71, August-September 1971.

Sta. No.	Meter No*	Meter Depth	Water Depth	Period of Observation
23	HP# 504	2 m	27 m	8.8 hrs.
	HP# 404	17 m		21.7 hrs.
	GE	26 m		25.8 hrs.
67	HP# 504	3 m	25 m	10.0 hrs.
	HP# 404	15 m		7.7 hrs.
	GE	24 m		10.0 hrs.
69	HP# 504	4 m	25 m	9.0 hrs.
	HP# 404	15 m		12.5 hrs.
	GE	24 m		12.0 hrs.
90	HP# 504	2 m	22 m	10.0 hrs.
	HP# 404	13 m		10.2 hrs.
	HP	21 m		11.0 hrs.
94	HP# 404	13 m	28 m	12.2 hrs.
	GE	27 m		12.0 hrs.

HP#—Hydroproducts Current Meter Model 501, operated by USCG

GE#—Geodyne Current Meter Model 102, operated by USCG

Surface currents (2-3 m level) normally fell within the same quadrant as the wind direction unless the winds were of insufficient speed (<5 kts., such as at stations 23 and 69, fig. 27). In general, the surface currents were too weak and random to determine normal flow patterns and their relationship to local geography, meteorology and hydrological conditions. Sudden shifts in surface current direction were observed at station 69 (speed, however, remained nearly constant at

0.09 kts.) when a westerly flow shifted south for four hours before suddenly returning to a westward direction. Again, interpretation of this change is hampered due to vessel motion and insufficient data.

The subsurface currents generally coincided with each other in direction and occasionally in speed. However, their relation to the surface current appears completely independent, with directions often being 180° out of phase (examination of physical data suggests the presence of a strong pycnocline to approximately 10 meters). Station 67 is the only exception with rather uniform westward flowing currents exhibited during the observation period (fig. 105). Investigation of the predicted tide information further varified the mutual current activity at station 67 in that a slight shifting in current direction occurred at all three levels approximately 45 minutes prior to high tide (fig. 110).

Subsurface currents at all current meter stations were compared with the predicted tide curves (U.S. Dept. of Commerce, 1970) for the Flaxman Island area (70°11′N, 145°50′W) in an attempt to correlate tidal activity with variations in current velocity. Figures 109 to 111 show the tide cycles for the period the current meters were recording. Significant changes in current direction are annotated along the time reference axis of these figures. Current meter stations 23, 67, and 69 consistently recorded a change in flow direction approximately one hour before the predicted time of high or low water. There is a slight indication that current direction tends to shift between a NW to NE bearing with the approach of high water, and a S to SE flow with the arrival of low water. Stations 90 and 94 (figs. 107 and 198) exhibited similar dependency to the tide, with exception that shifts in current direction occurred approximately one hour following high or low water. This was probably due to the fact that stations 90 and 94 were 165 miles west of Flaxman Island, while stations 23, 67, and 69 were only 42 miles. The random variation in current speed appears to be independent of tidal activity; however, the weak currents in this area and the errors introduced by vessel motion makes any correlation impossible.

The limited data from 1971 suggests a two current system with the primary driving forces determining current velocity being a complex relation between surface winds and the boundary conditions imposed by continuity. The weak mixed tides (range approximately 15 cm) found in this area appear to have some influence on direction to the subsurface (>10 m) currents.

CONCLUSION

1. Dynamic equilibrium is poorly developed or absent in the surface waters of the western Beaufort Sea. Wide variations in temperature and salinity reflect the lack of steady-state conditions.

2. The water masses in the upper 200 meters of the western Beaufort Sea during the summer are affected by seasonal heating, wind mixing, icemelt, and continental runoff; however their relative importance in the area is still somewhat unclear.

3. Limited data suggests a two current system on the continental shelf with the primary driving forces determining current velocity being a complex relation between surface winds and the boundary conditions imposed by continuity. The weak mixed tides (range ~ 15 m) found in the area appear to have some influence on direction of the subsurface (> 10 m) currents.

4. The general concentration of nutrients in the surface waters are very low with large spatial variations occurring because of icemelt, river runoff and advection. At the shallow pycnocline a nutrient minimum was found and is probably due to phytoplankton activity.

5. The distribution of dissolved oxygen as a function of depth, season, and nutrient concentration indicates that the high dissolved oxygen saturation values at the pycnocline during WEBSEC-71 may result from *in situ* photosynthetic production of oxygen rather than just atmospheric exchange. To test this hypothesis, a method similar to Codispoti and Richards (1971) was attempted. Initial nutrient (phosphate and nitrate) and oxygen concentrations were assumed using values from the deep shelf with saturation near 100% (table 4). Final

Table 4.—Estimation of dissolved oxygen supersaturation from photosynthesis using nutrient utilizations.

1. Estimated initial PO_4 concentration = 1.01 μg-at/l

2. Estimated initial NO_3 concentration = 6.0 μg-at/l

3. Estimated initial O_2 concentration = 7.95 ml/l

4. Estimated PO_4 utilization = 1.01 - 0.59 μg-at/l = 0.42 μg-at/l

5. Estimated NO_3 utilization = 6.0 - 0.3 μg-at/l = 5.7 μg-at/l

6. O_2 added based on PO_4 utilization = 0.42 μg-at/l x 27 = 115.92 μg-at/l = 1.29 ml/l

7. O_2 added based on NO_3 utilization = 5.7 μg-at/l x 17.2 = 98.04 μg-at/l = 1.09 ml/l

8. Supersaturation based on PO_4 utilization $\frac{7.95 + 1.29}{7.95} \times 100 = 116\%$

9. Supersaturation based on NO_3 utilization $\frac{7.95 + 1.09}{7.95} \times 100 = 113\%$

*$\Delta O:\Delta N:\Delta P = 276:16:1$

nutrient concentrations were based on values from WEBSEC-71 samples taken at the oxygen maximum. The ratios of change of oxygen and nutrients determined by Redfield, Ketchum and Richards (1963) were used. The estimated values of oxygen saturation, 116% (PO_4) and 113% (NO_3) (table 4) fit closely the observed saturation values (120%) at 15 meters from WEBSEC-71. The small difference between the estimated and observed values are probably due to errors in the assumptions. However, it is evident that photosynthesis can cause considerable oxygen saturations of these waters.

There is the possibility that the high supersaturation values are from earlier photosynthetic activity rather than from present activity. Sverdrup (1929) found high oxygen supersaturations in the eastern Arctic and attributed them to ice cover preventing photosynthetically produced oxygen from escaping to the atmosphere. This mechanism is probably important in the early summer when a thin ice cover may be present. The highly photosynthetically oxygenated water would then sink to deeper depths with the oneset of heavy icemelt (which forms a dilute surface layer). The poor mixing in the area would help in maintaining the subsurface oxygen maximum. The formation of the summer pycnocline would also help to maintain the layer. The observed maximum values during WEBSEC-71 were usually at or below the strong pycnocline. Since stability reduces vertical eddy diffusion and hydrostatic pressure (though small) increases oxygen solubility, the condition of the observed high values of saturation being below the pycnocline favors the retention of oxygen.

Other mechanisms were studied to determine if they might account for the observed supersaturations. Mixing of any of the water masses present in equal parts would give saturation values only up to 101%. *In situ* warming even up to 3°C could not cause saturations greater than 106%. The observed saturations are not entirely due to sea-air interchange because the surface water should equilibrate with the atmosphere quickly. Also, the observed supersaturations are associated with higher salinity water (>27‰) than found at the surface.

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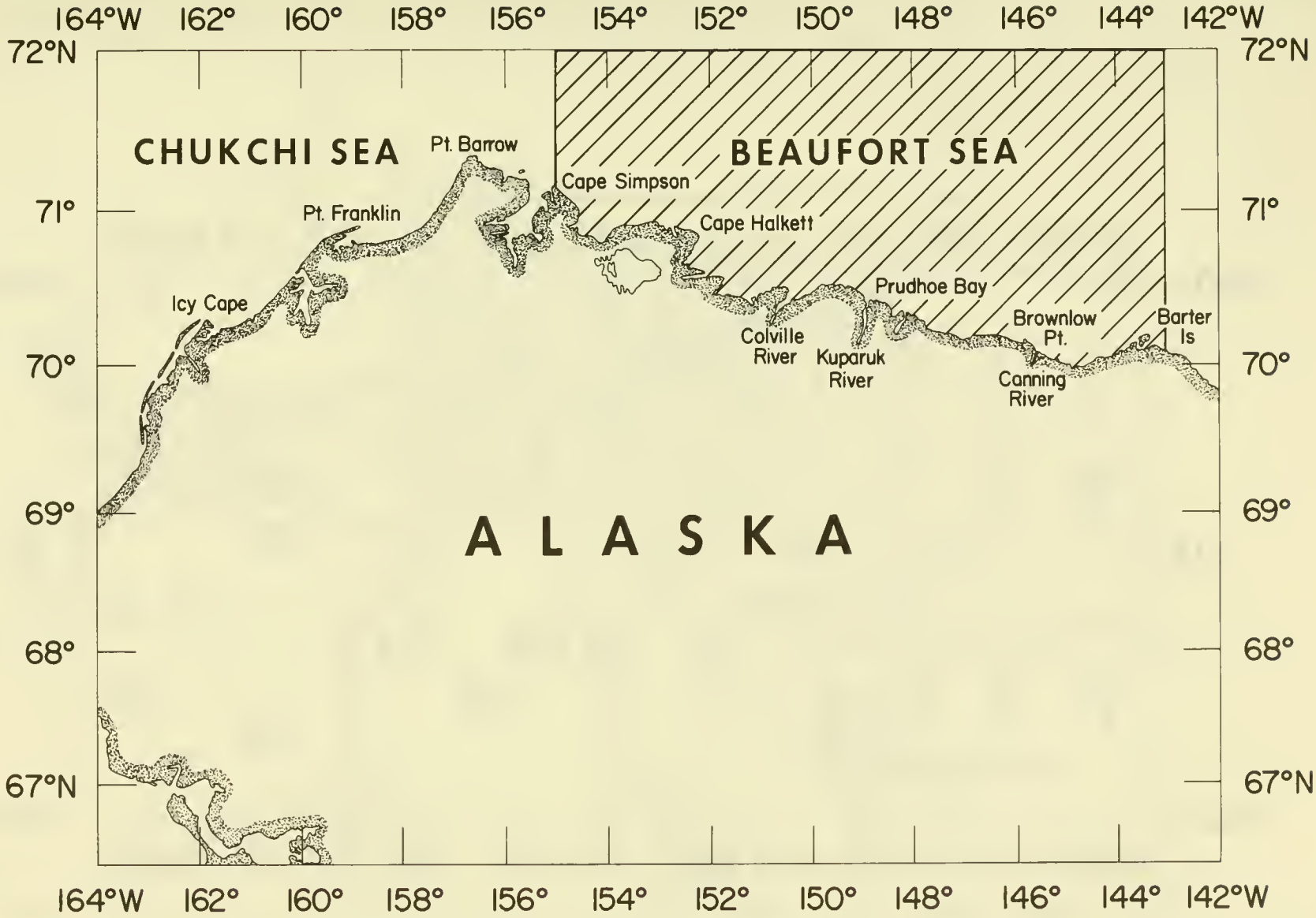

Figure 1.—Location of area studied during WEBSEC-71 and 72, August-September, 1971 and 1972.

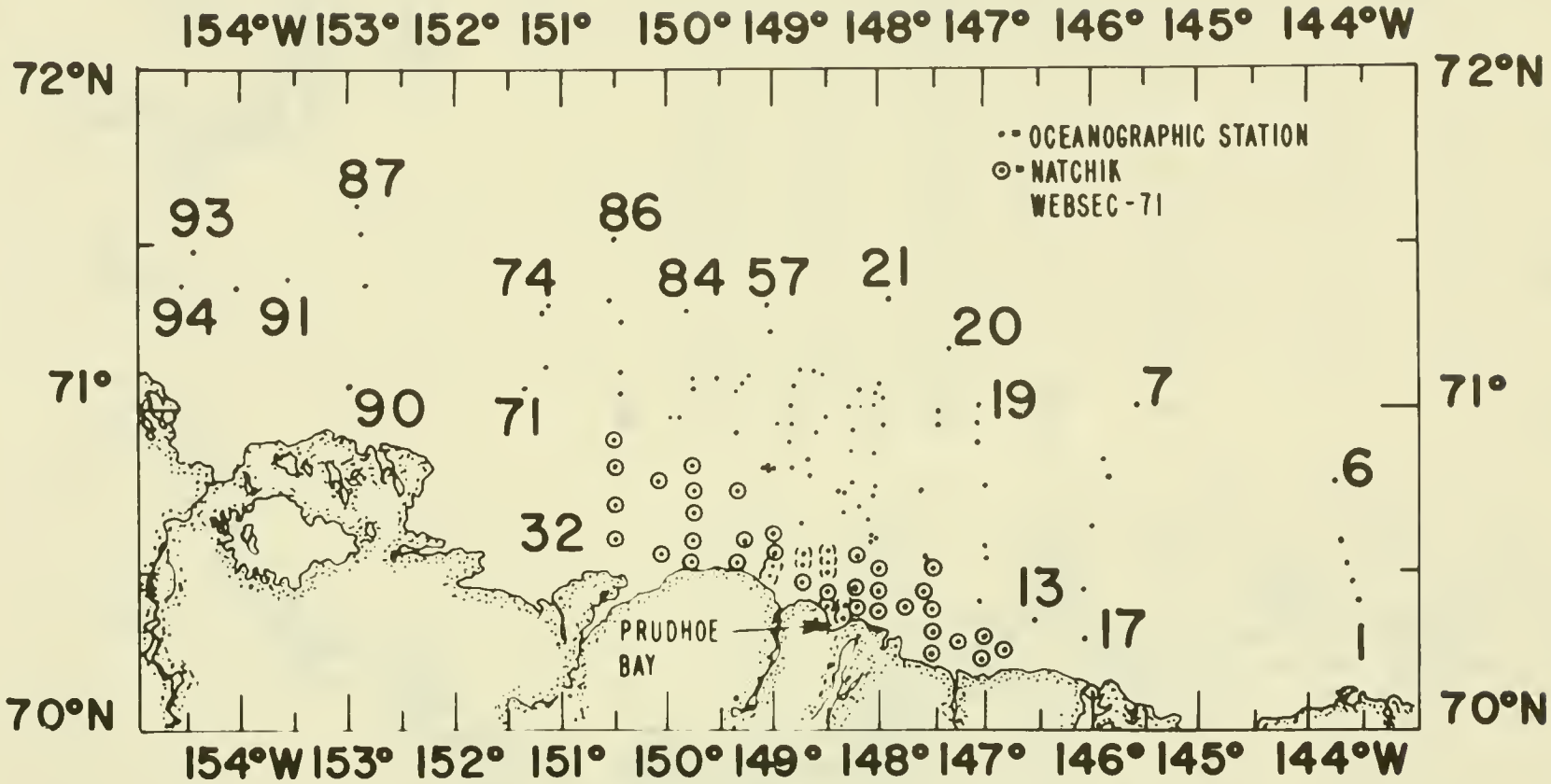

Figure 2.—Location of oceanographic stations and sections WEBSEC-71, August-September, 1971.

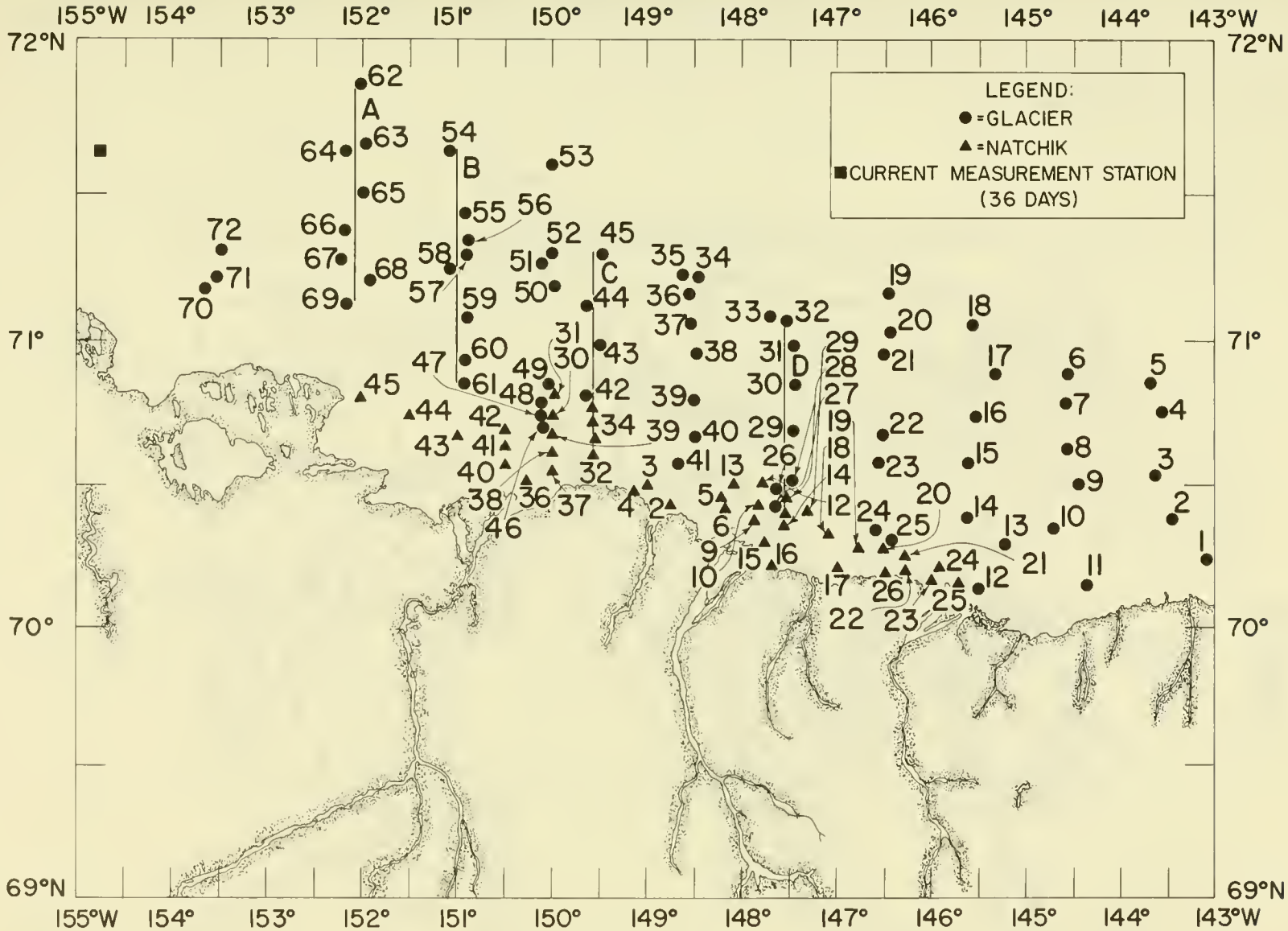

Figure 3.—Location of oceanographic stations and sections WEBSEC-72, August-September, 1972.

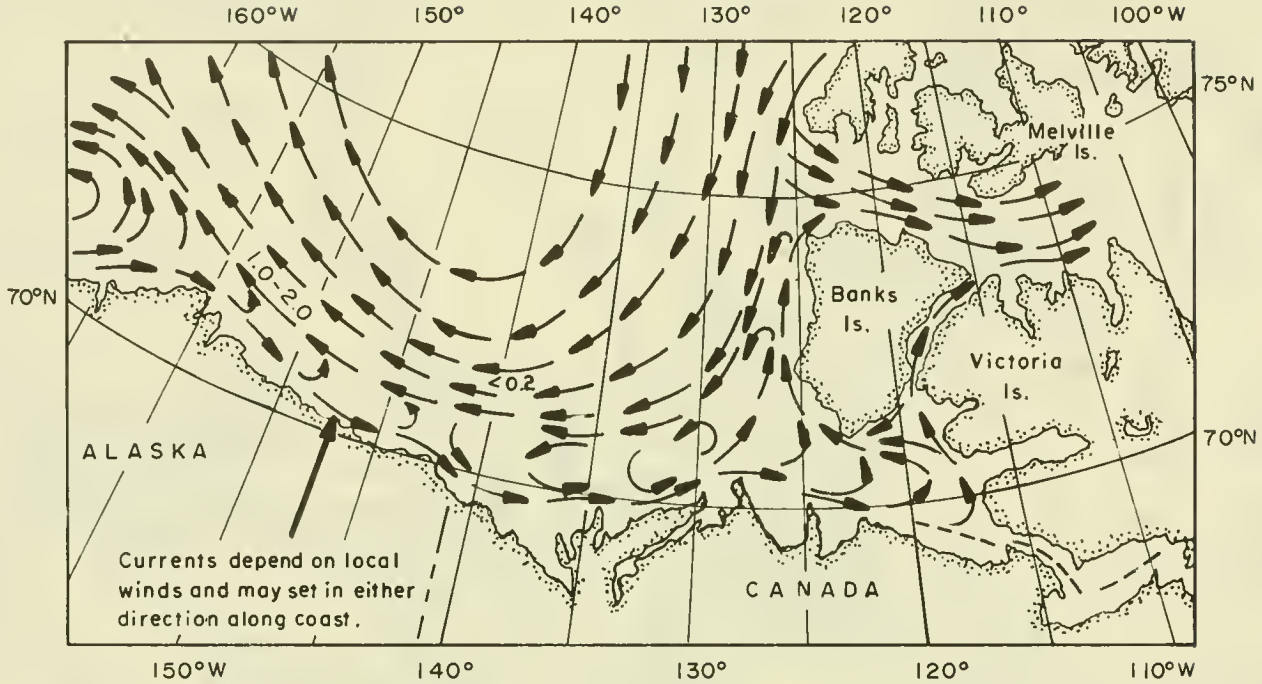

Figure 4.—Average surface currents for Beaufort Sea (from USNHO Oceanographic Atlas of Polar Seas—Part II, 1968). Current speed is given in knots.

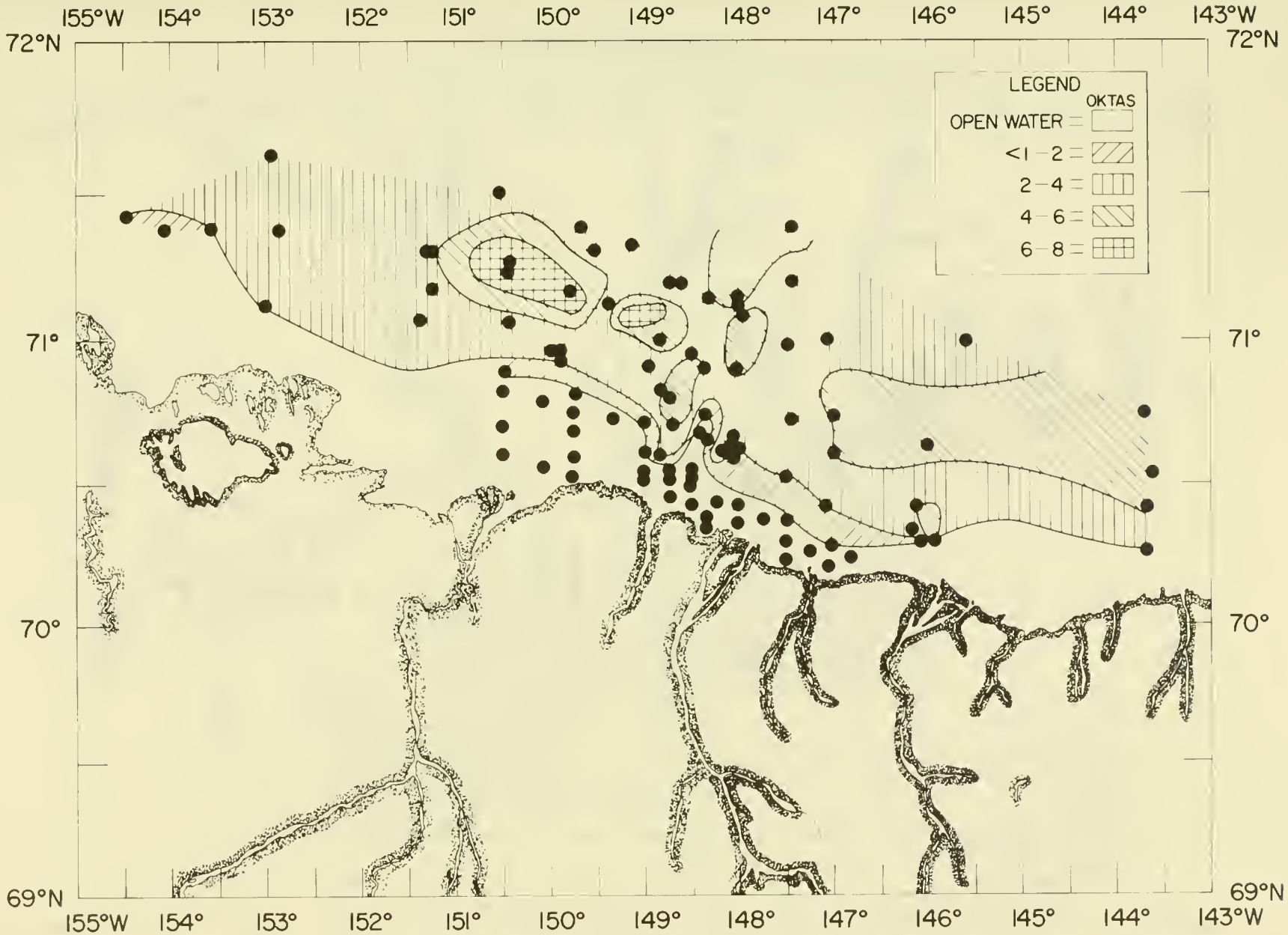

Figure 5.—Distribution of ice concentration during WEBSEC-71, August-September, 1971. (based on CGC GLACIER observations).

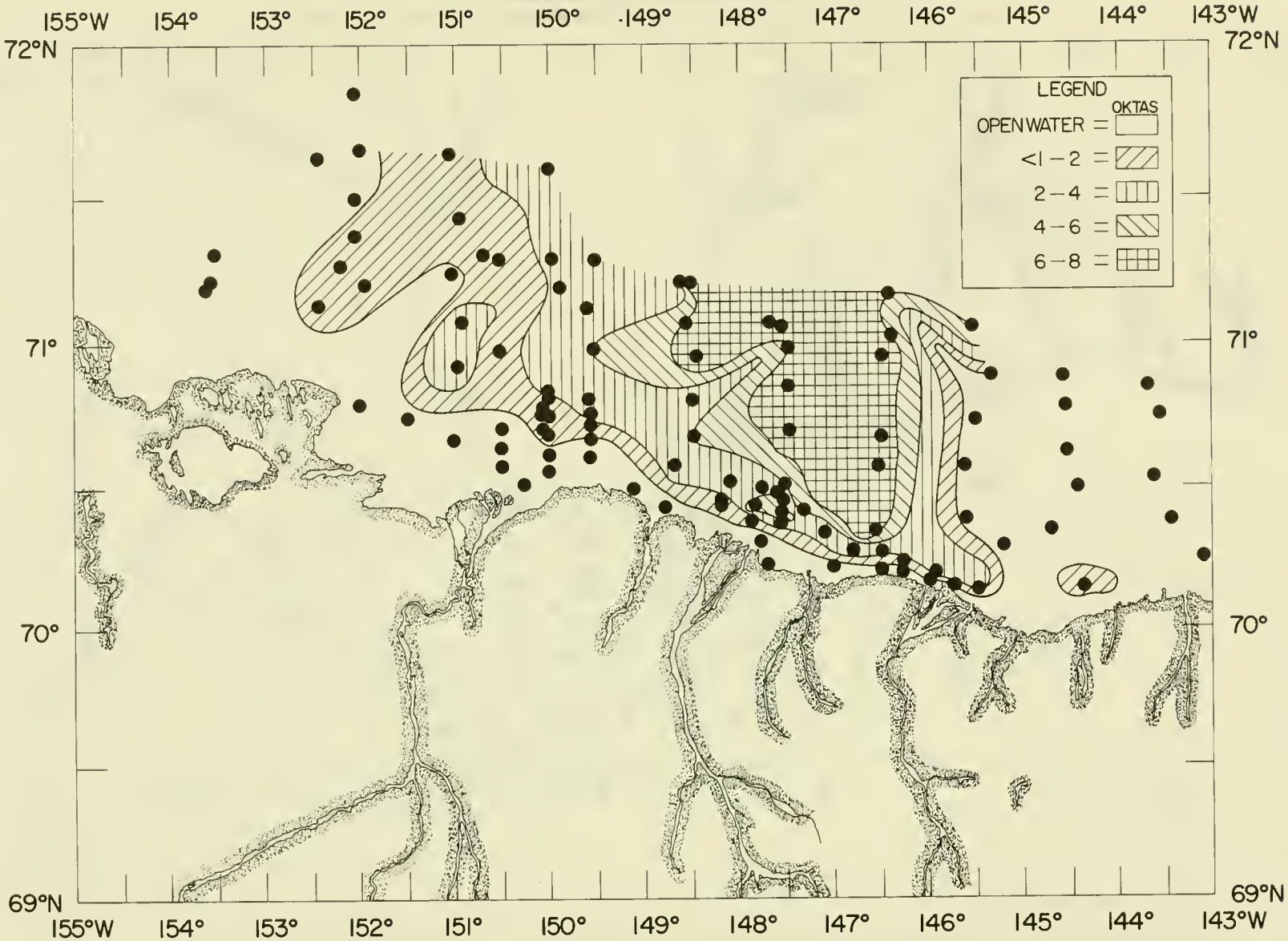

Figure 6.—Distribution of ice concentration during WEBSEC-72, August-September, 1972. (based on CGC GLACIER observations).

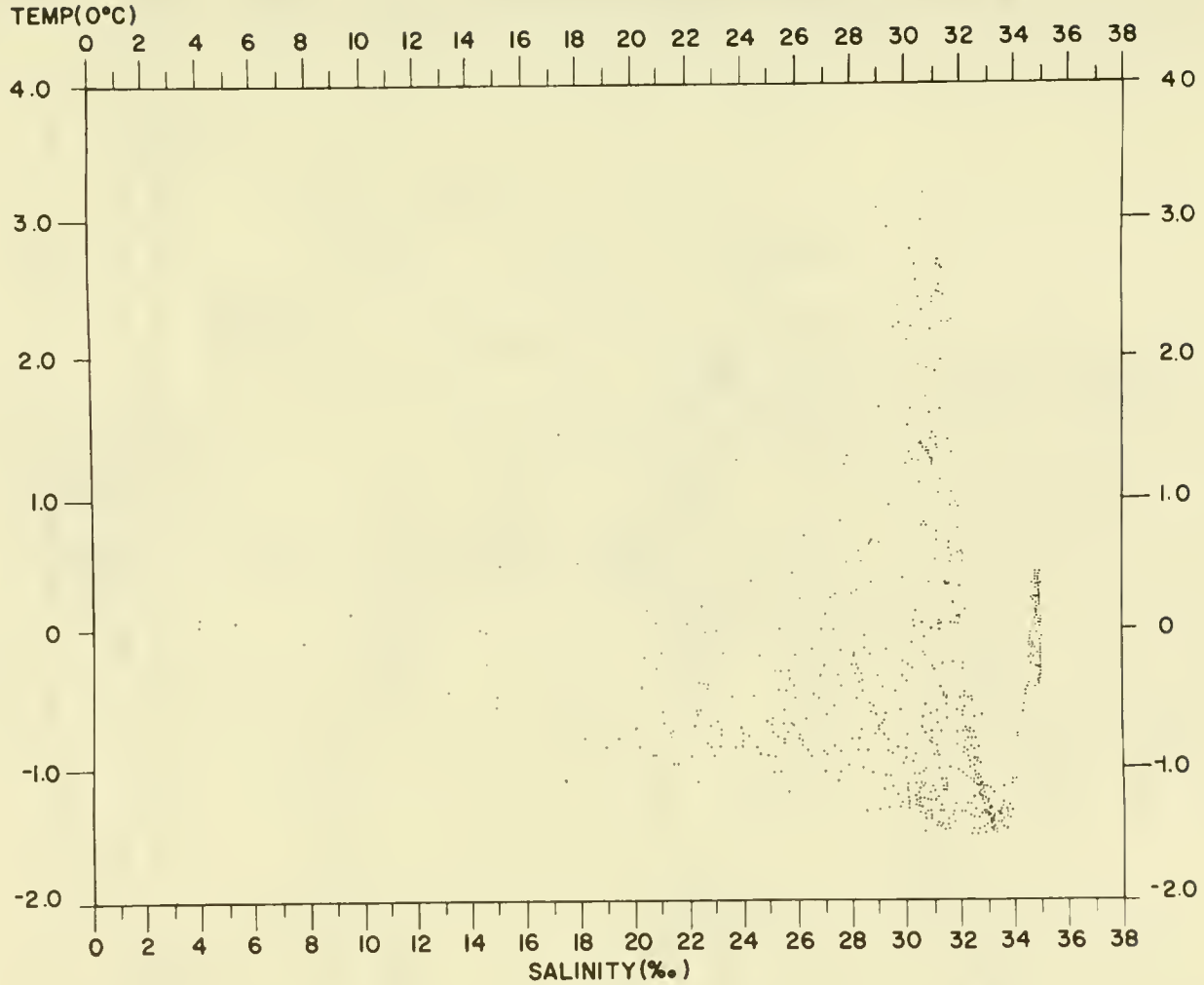

Figure 7.—Temperature (°C)-salinity (‰) values during WEBSEC-71, August-September 1971.

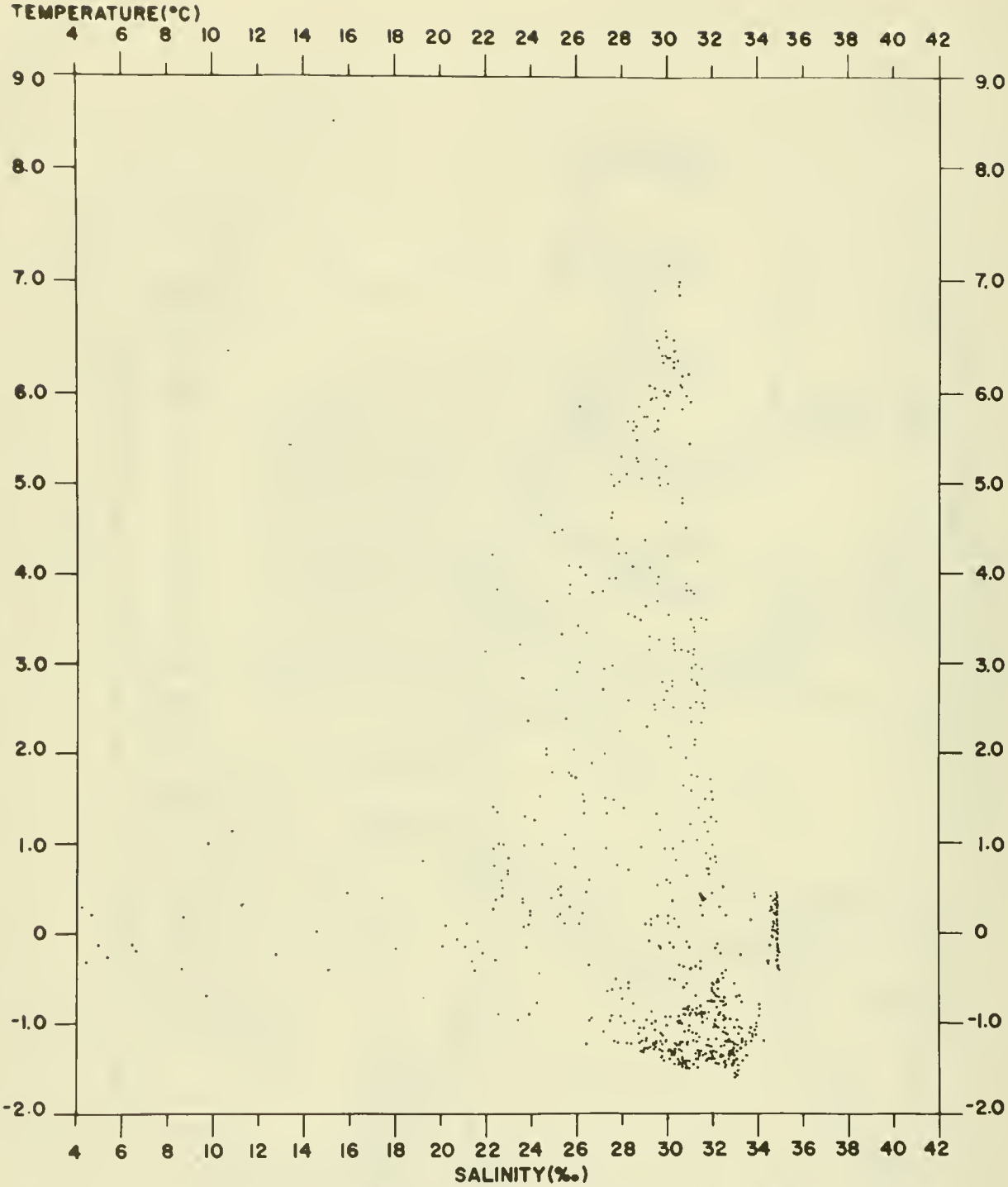

Figure 8.—Temperature (°C)-salinity (°/oo) values during WEBSEC-72, August-September, 1972.

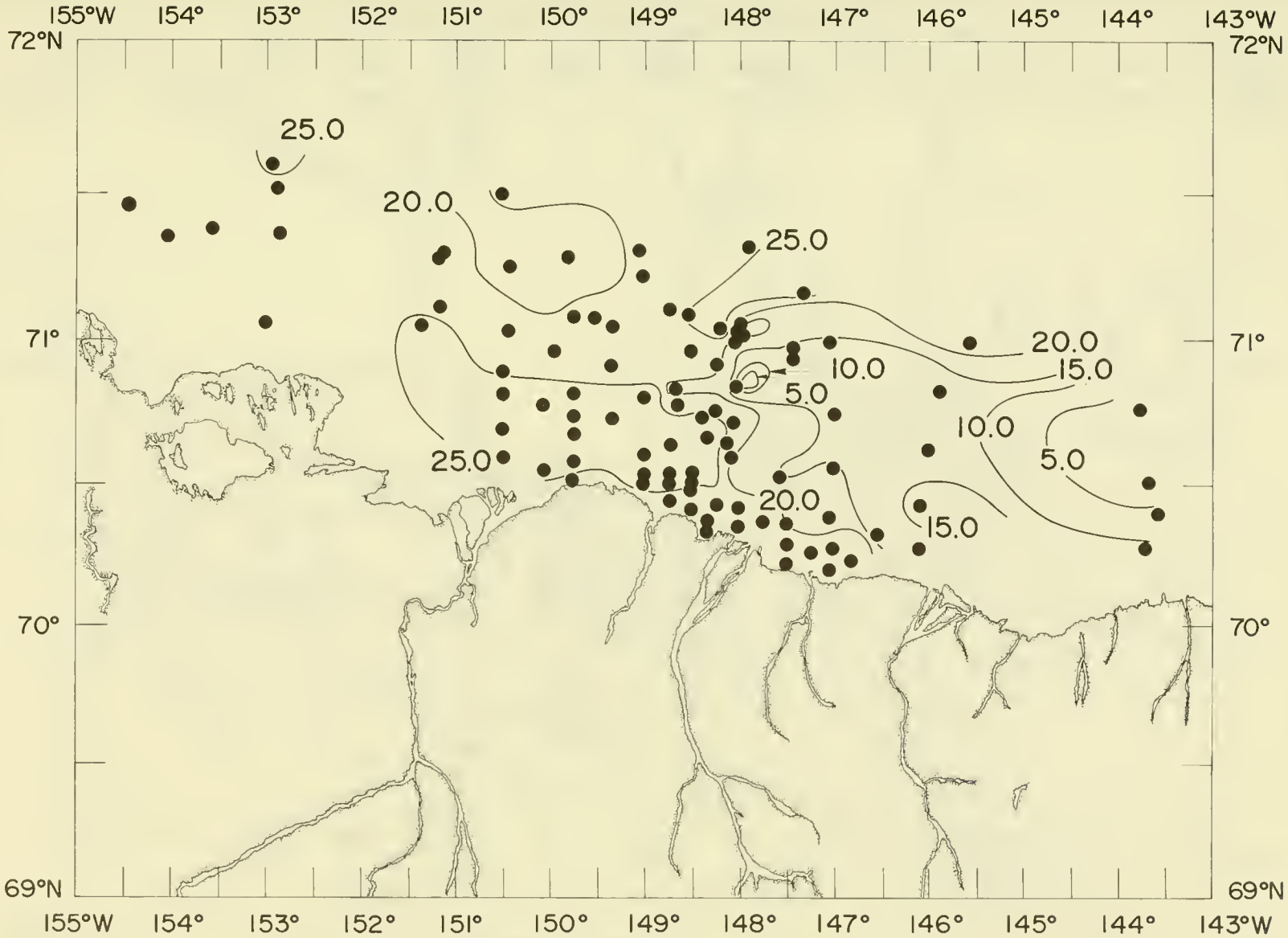

Figure 9.—Sea surface salinity (‰) during WEBSEC-71, August-September, 1971.

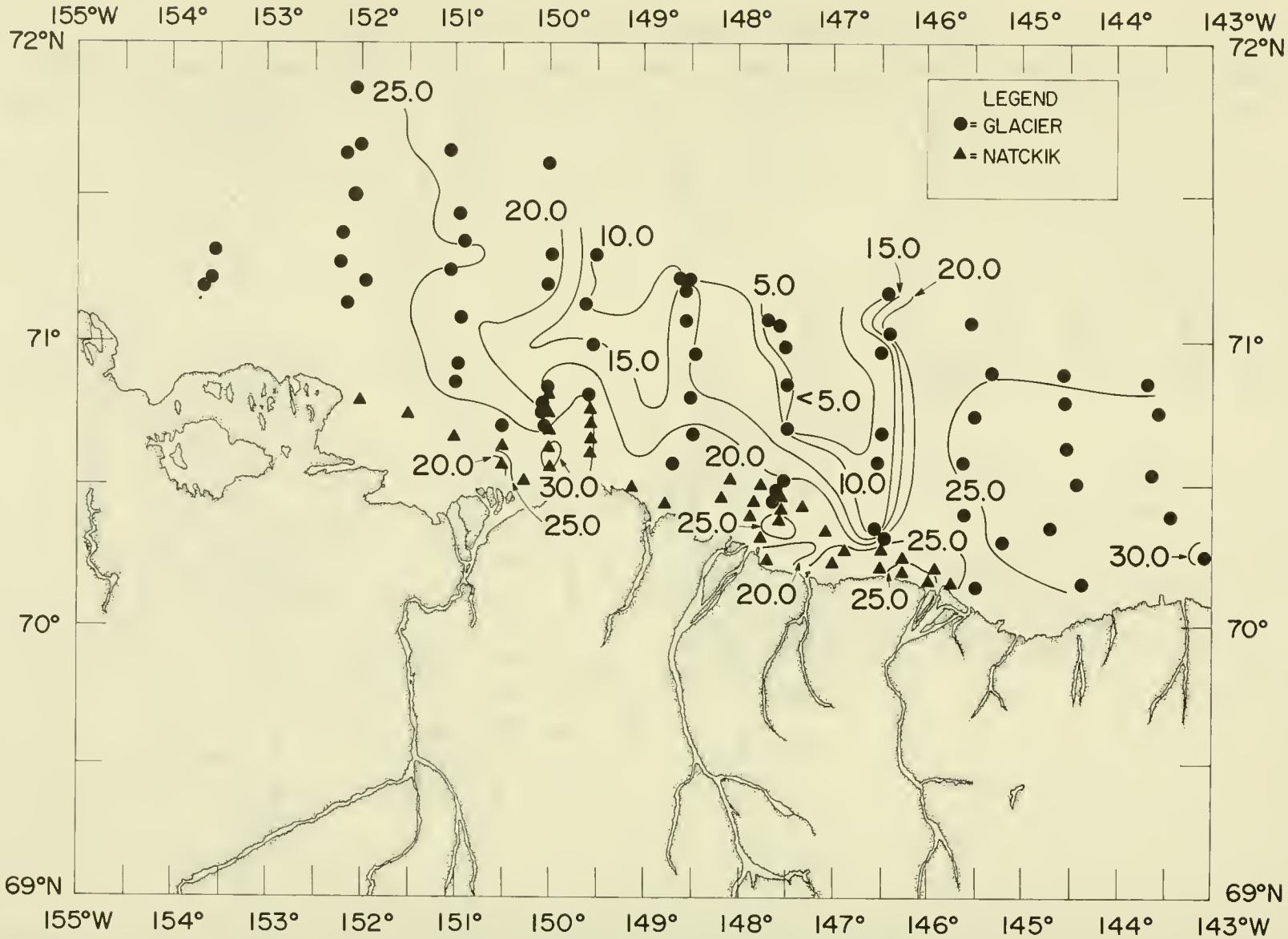

Figure 10.—Sea surface salinity (‰) during WEBSEC-72, August-September, 1972.

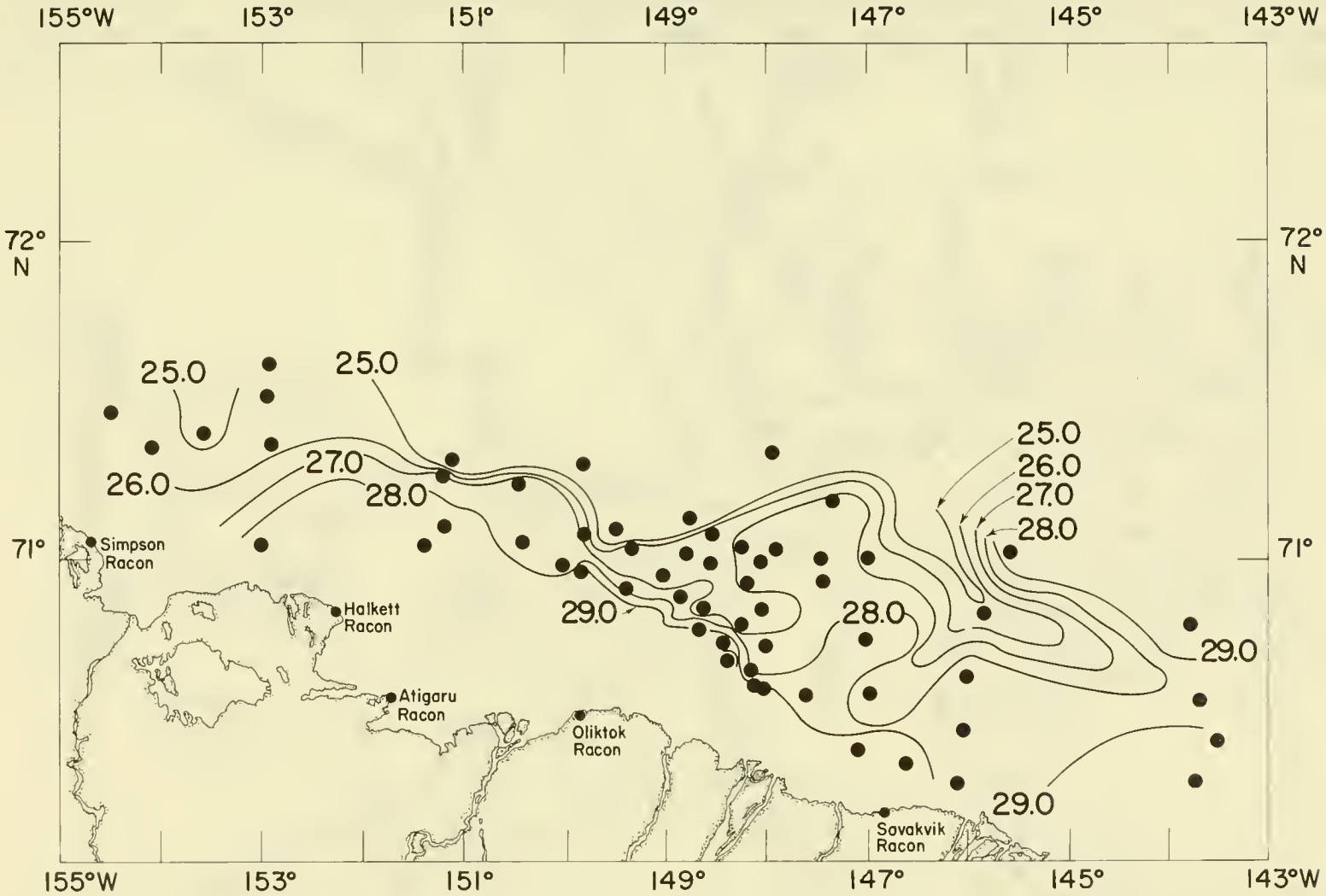

Figure 11.—Salinity (‰) at 10 meters during WEBSEC-71, August-September, 1971.

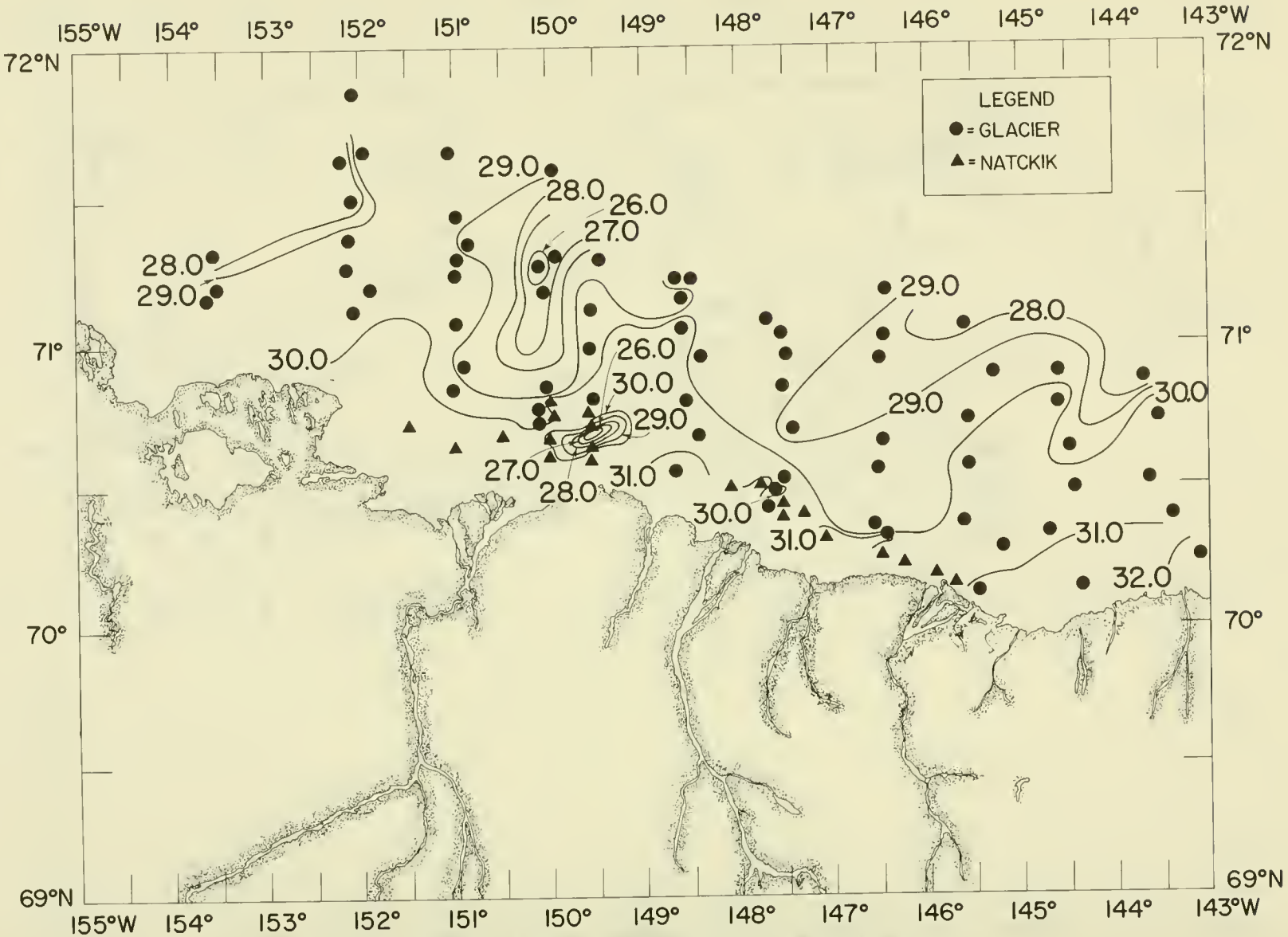

Figure 12.—Salinity (‰) at 10 meters during WEBSEC-72, August-September, 1972.

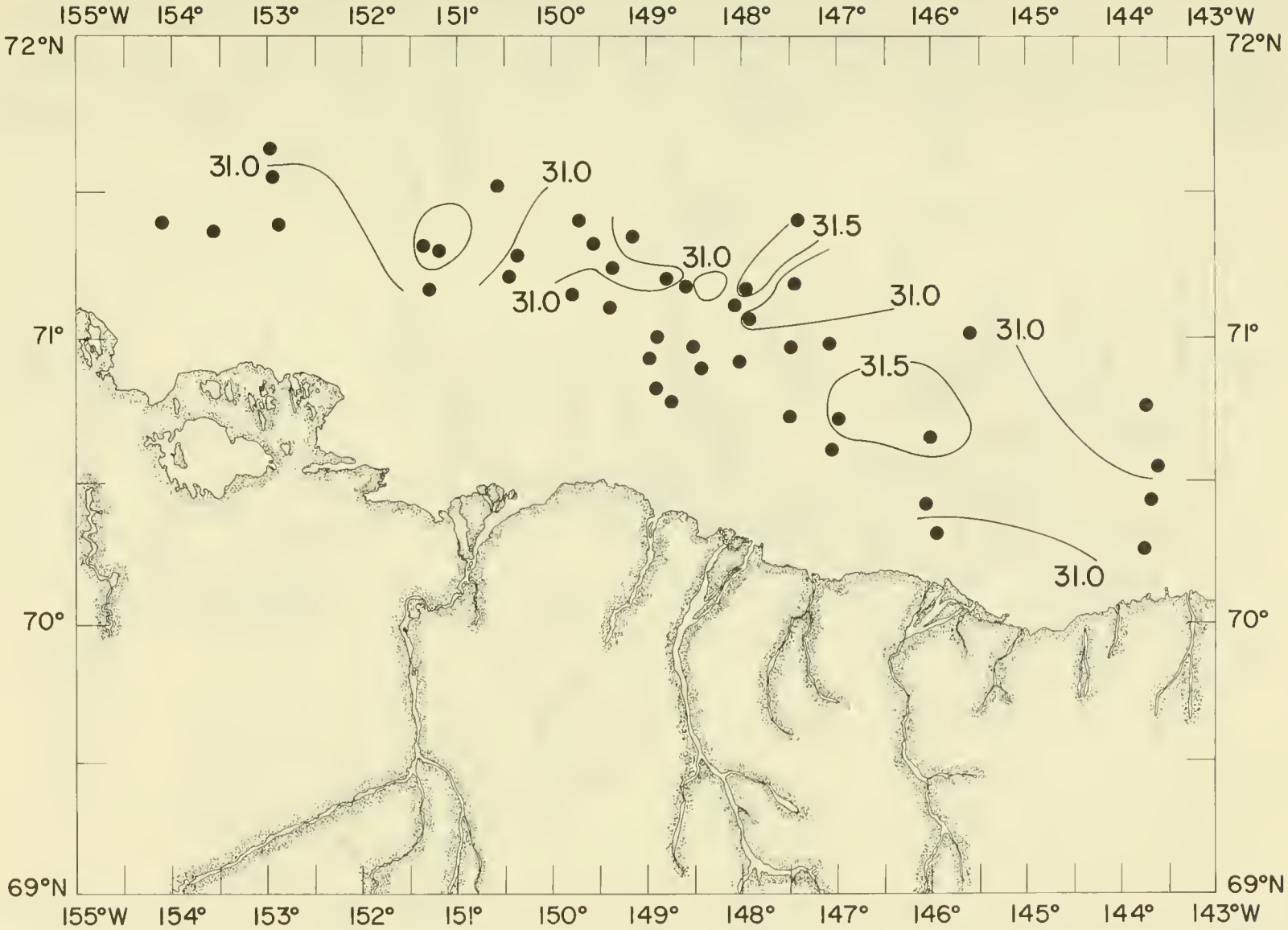

Figure 13.—Salinity (‰) at 30 meters during WEBSEC-71, August-September, 1971.

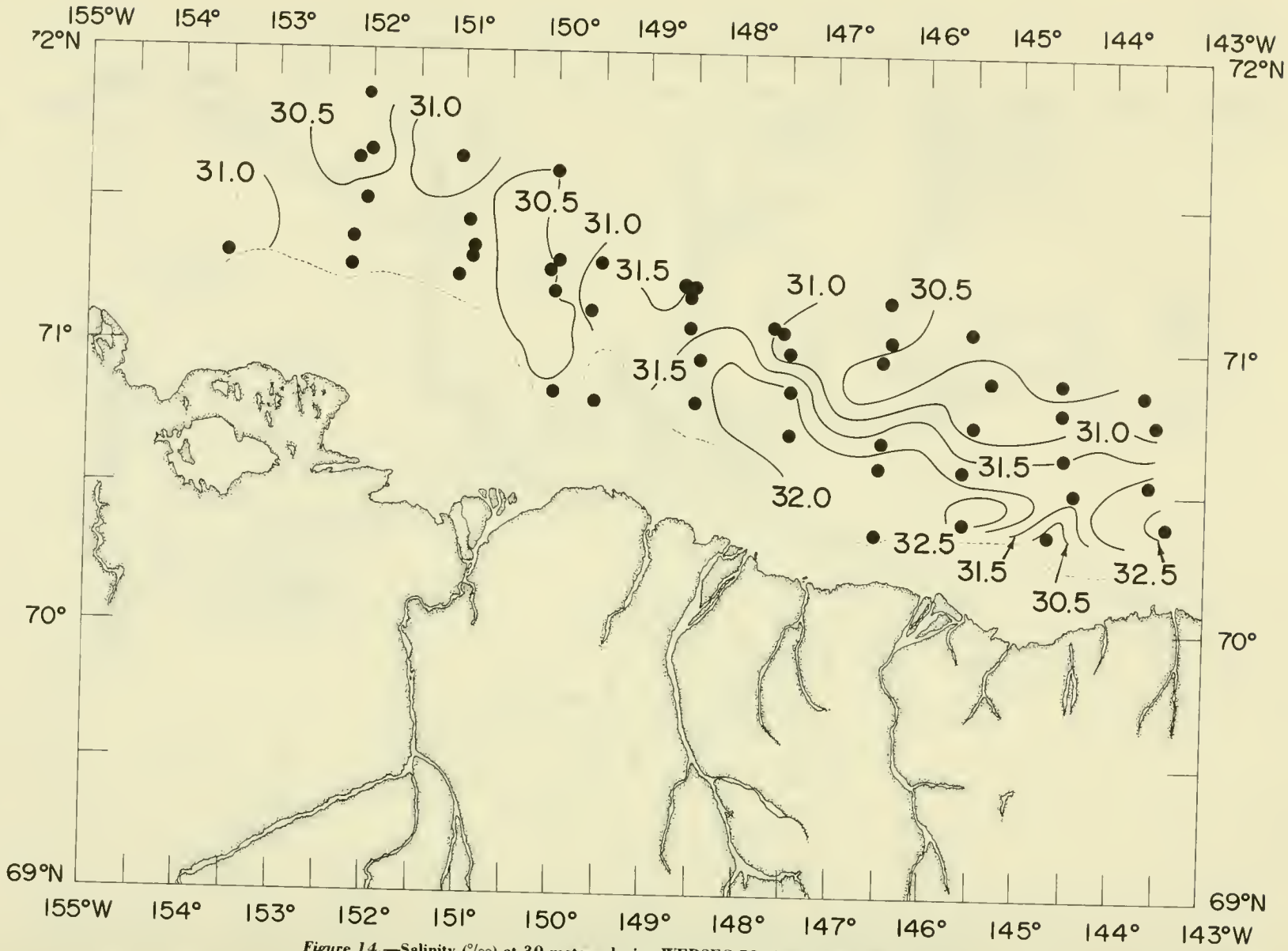

Figure 14.—Salinity (‰) at 30 meters during WEBSEC-72, August-September, 1972.

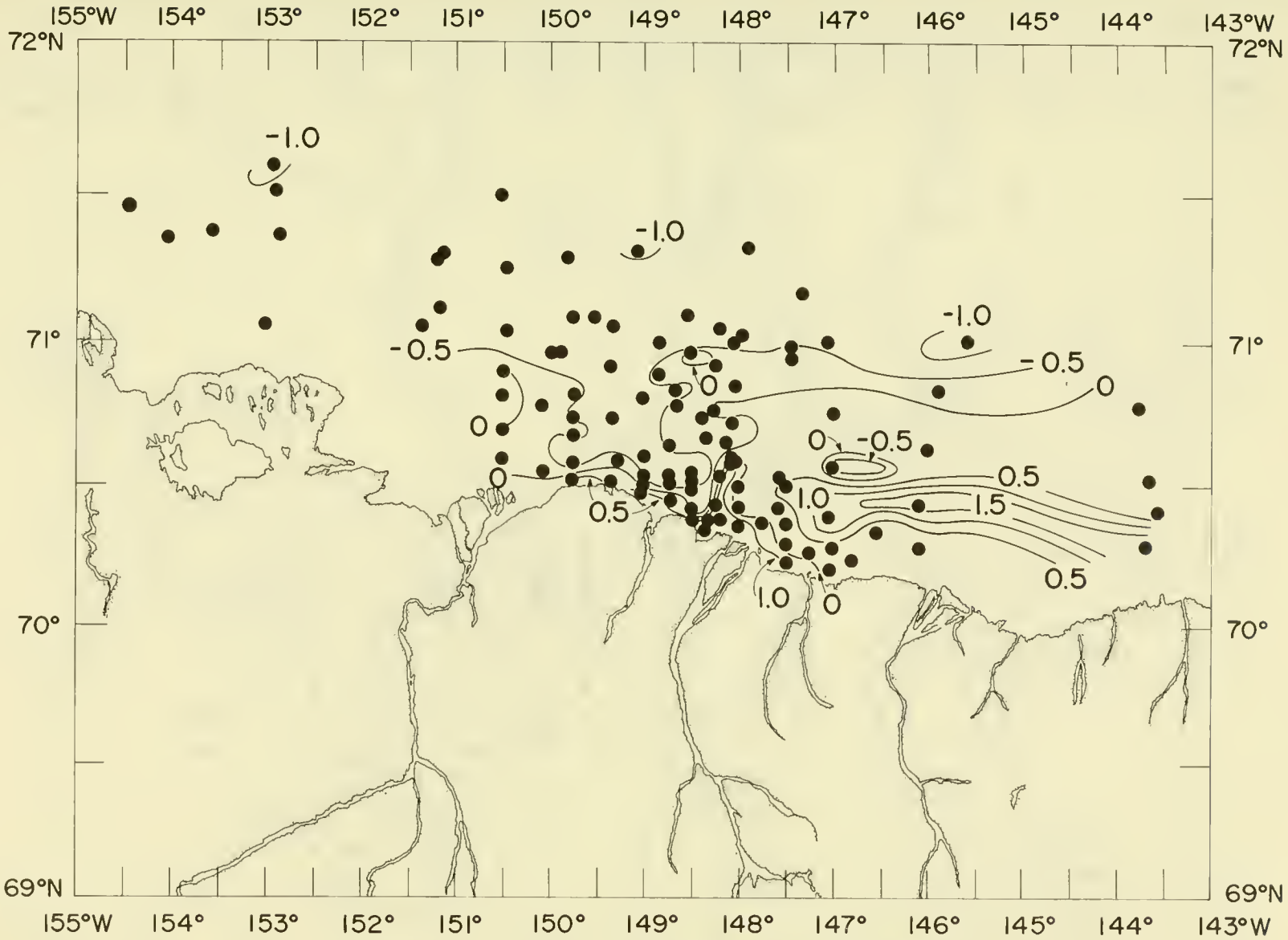

Figure 15.—Sea surface temperature (°C) during WEBSEC-71, August-September, 1971.

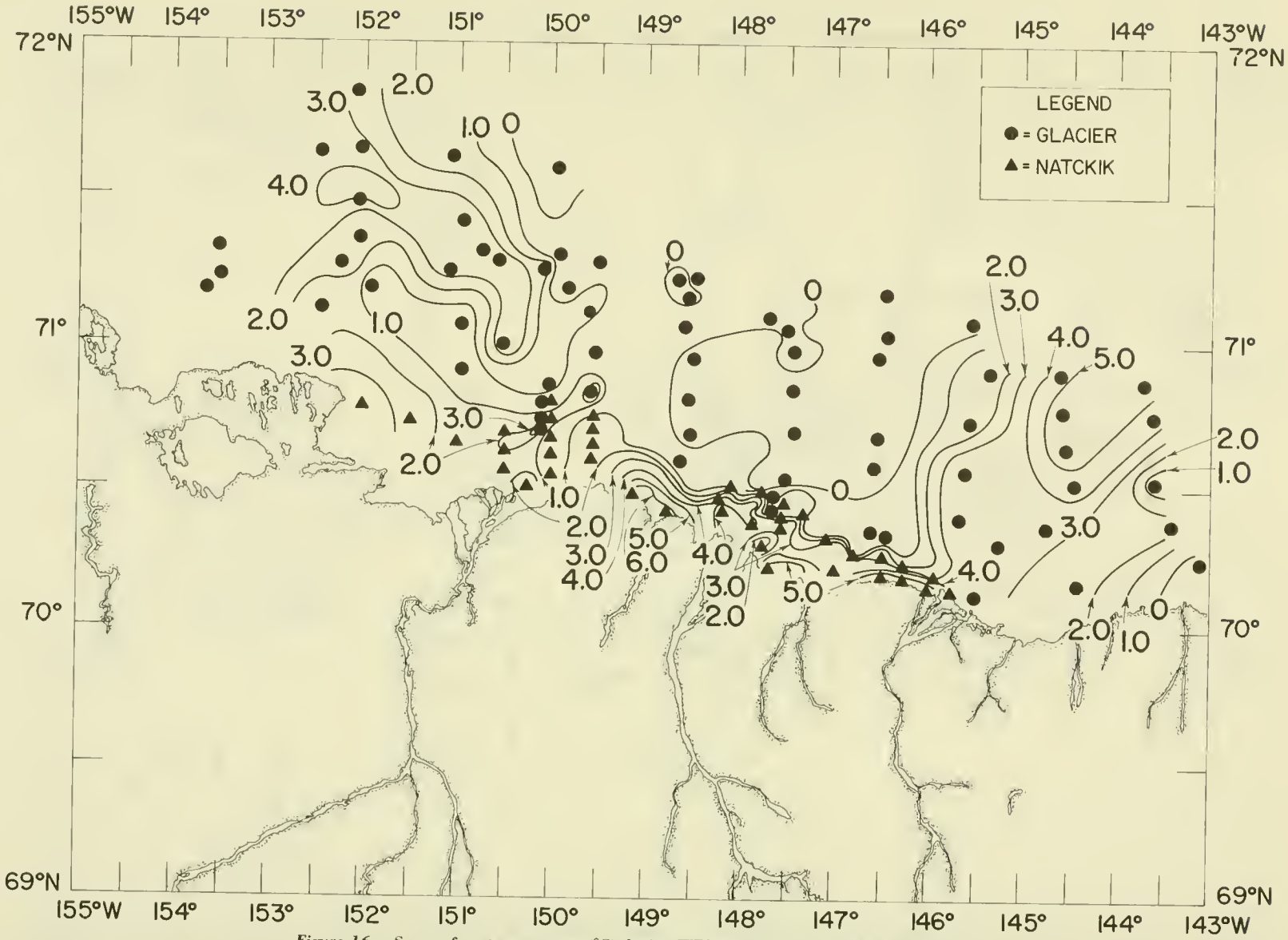

Figure 16.—Sea surface temperature (°C) during WEBSEC-72, August-September, 1972.

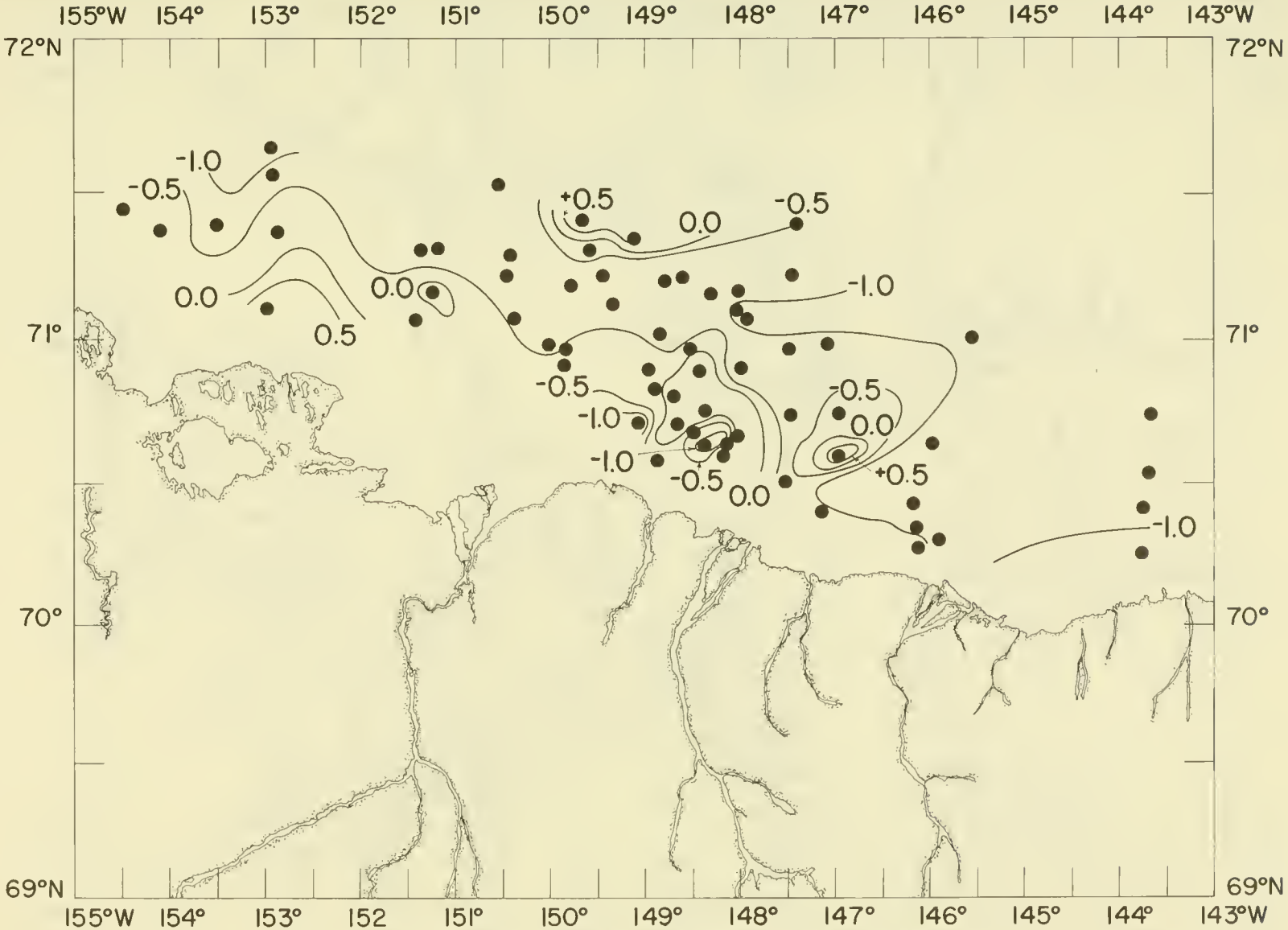

Figure 17.—Temperature (°C) at 10 meters during WEBSEC-71, August-September, 1971.

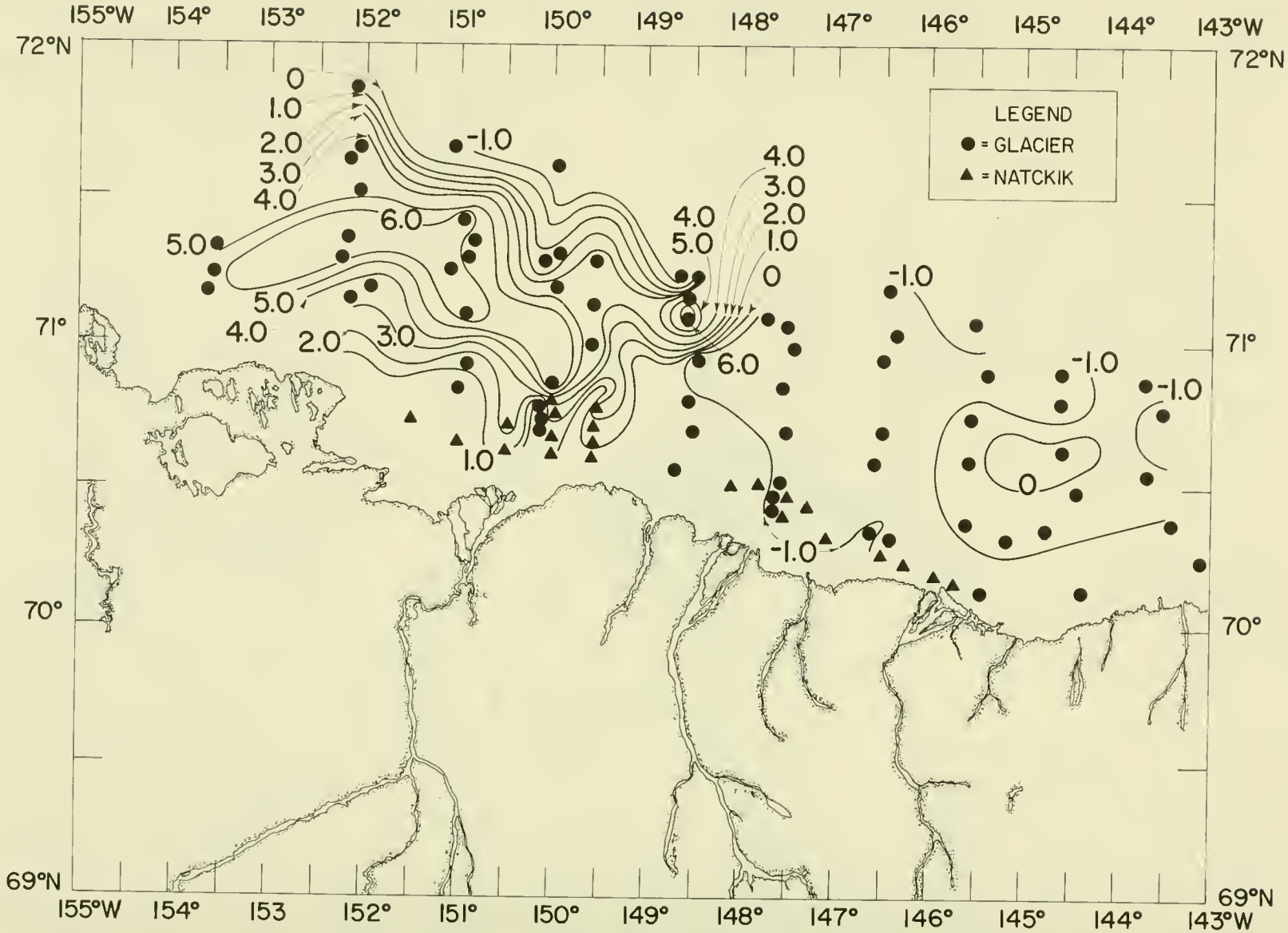

Figure 18.—Temperature (°C) at 10 meters during WEBSEC-72, August-September, 1972.

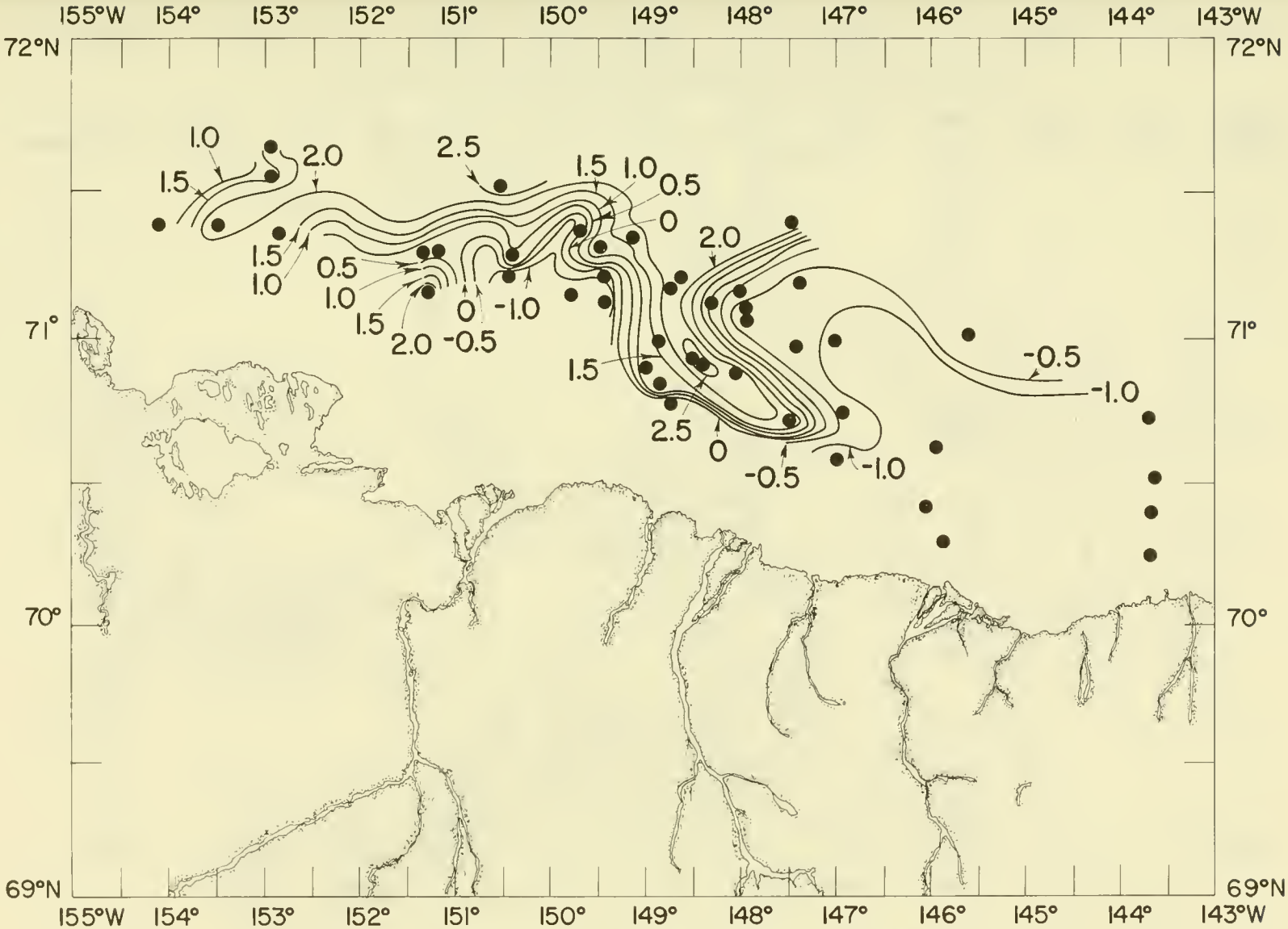

Figure 19.—Temperature (°C) at 30 meters during WEBSEC-71, August-September, 1971.

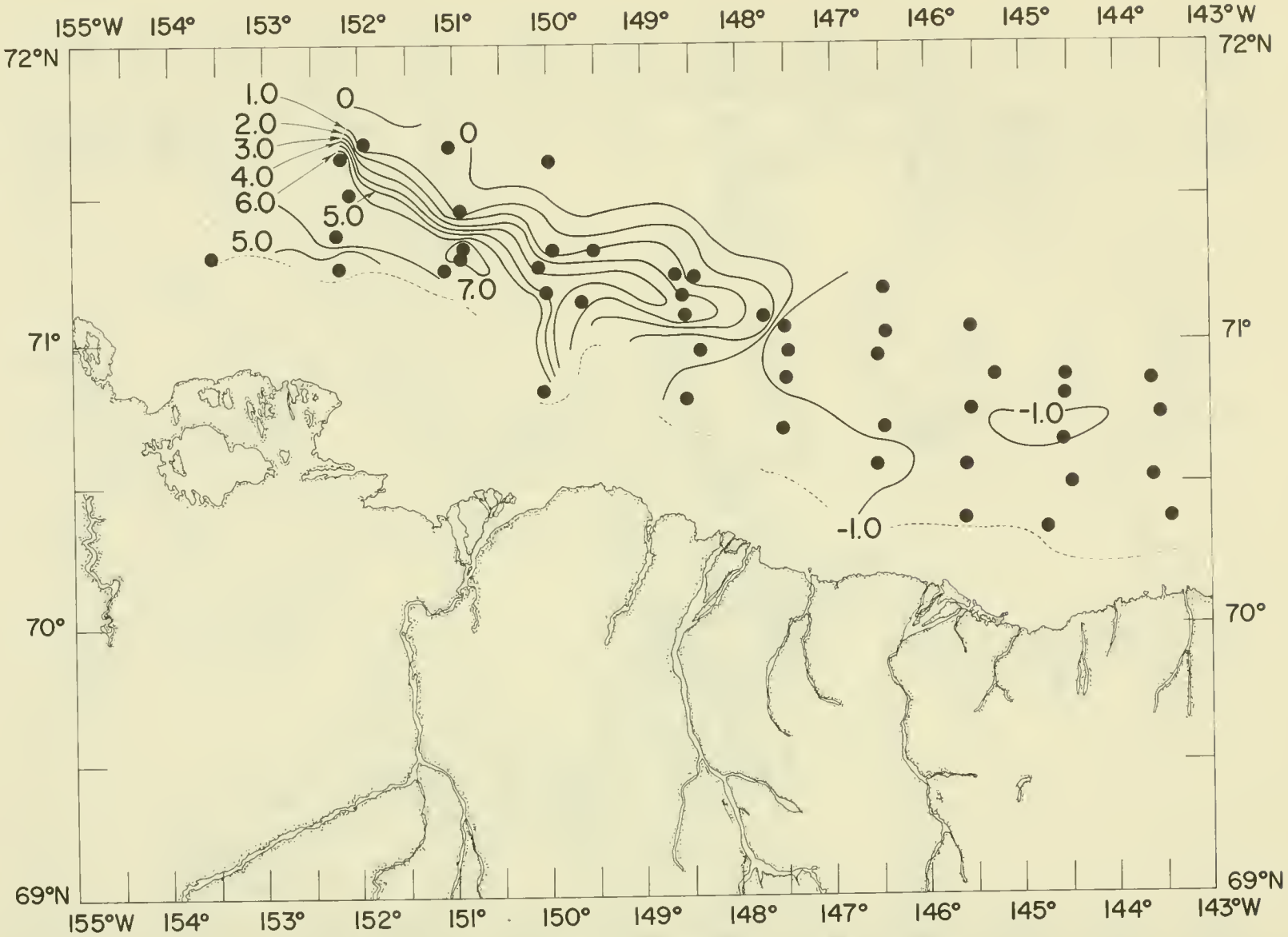

Figure 20.—Temperature (°C) at 30 meters during WEBSEC-72, August-September, 1972.

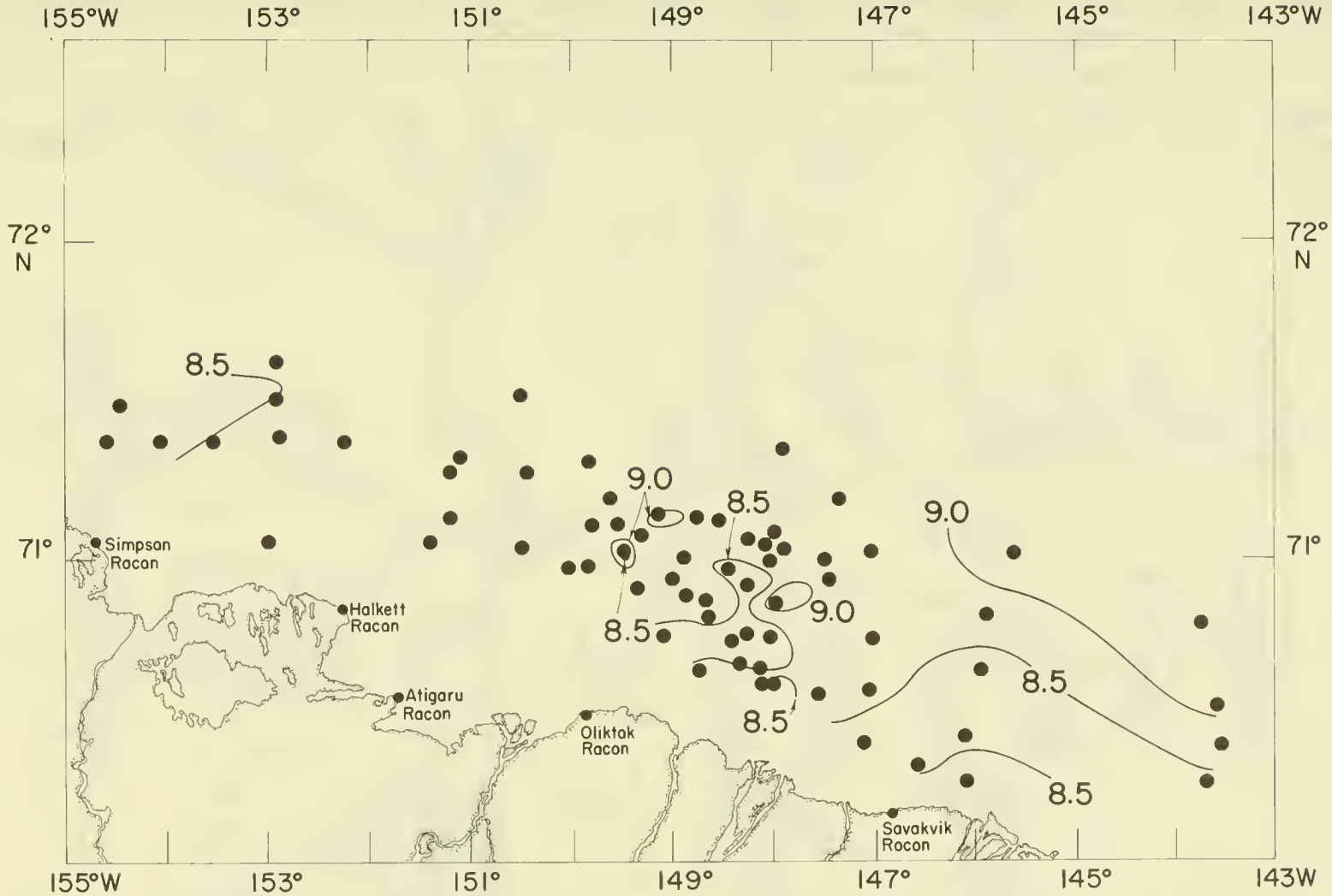

Figure 21.—Dissolved oxygen concentration (ml/l) at the sea surface during WEBSEC-71, August-September, 1971.

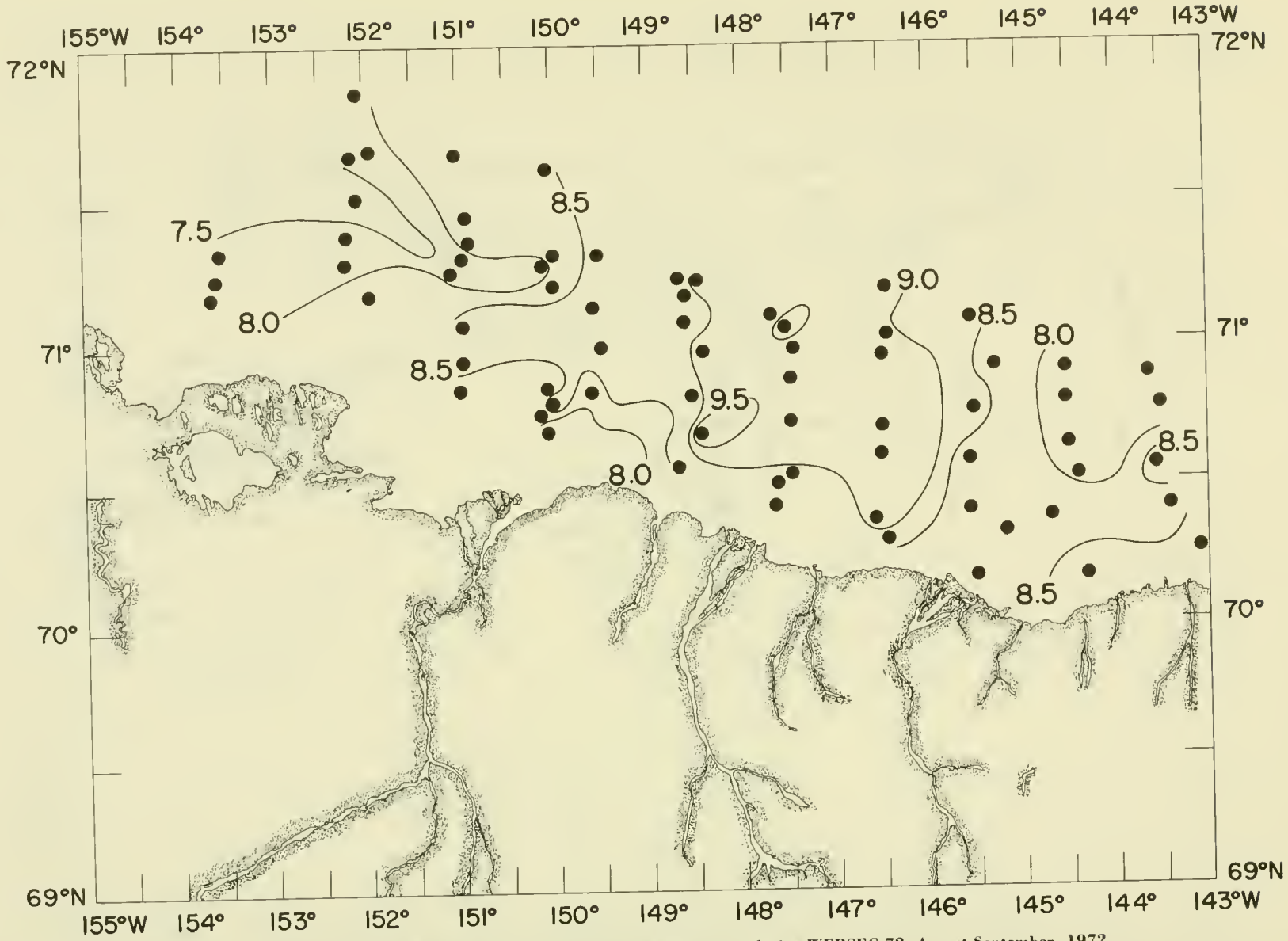

Figure 22.—Dissolved oxygen concentration (ml/l) at the sea surface during WEBSEC-72, August-September, 1972.

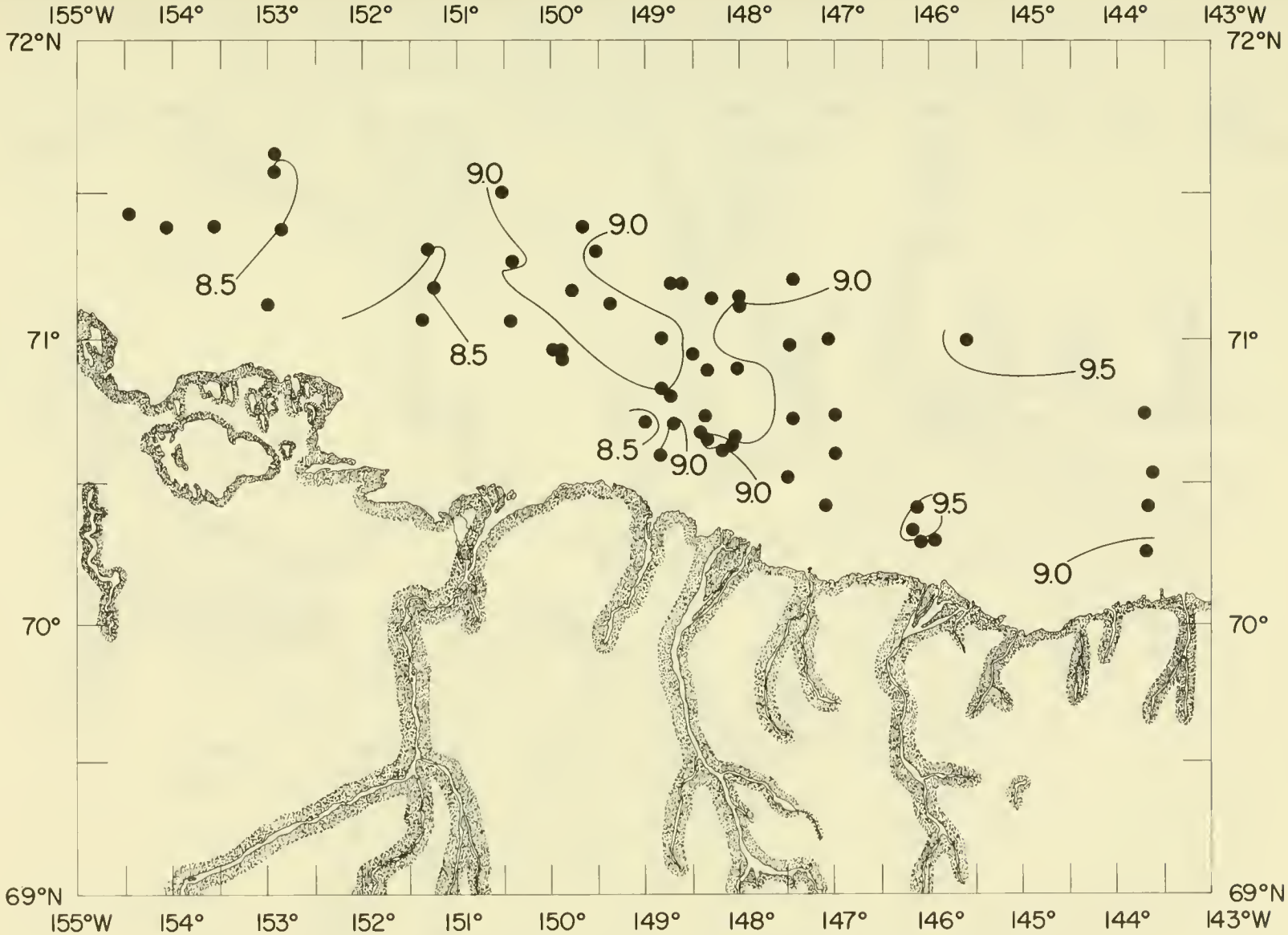

Figure 23.—Dissolved oxygen concentration (ml/l) at 10 meters during WEBSEC-71, August-September, 1971.

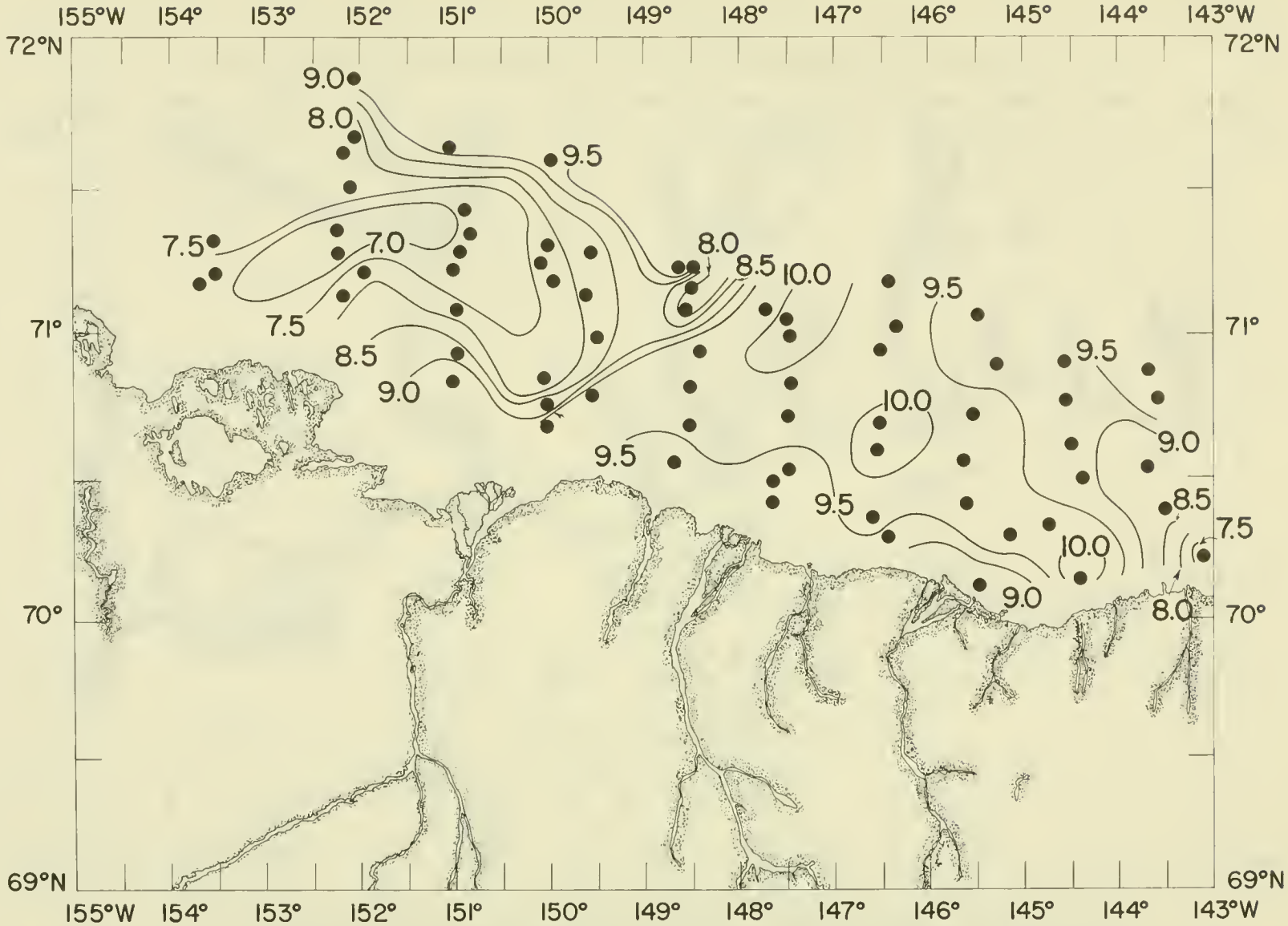

Figure 24.—Dissolved oxygen concentration (ml/l) at 10 meters during WEBSEC-72, August-September, 1972.

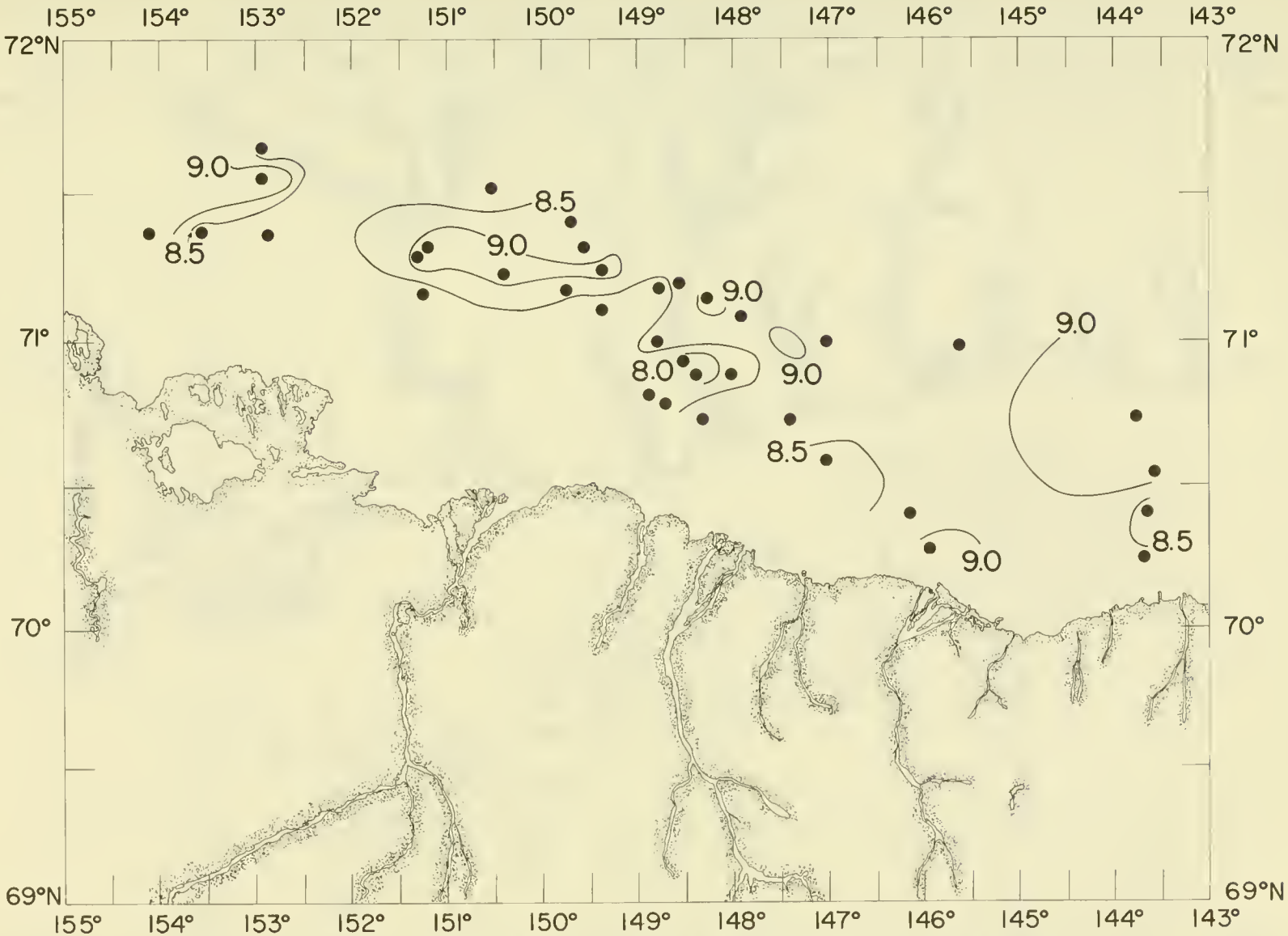

Figure 25.—Dissolved oxygen concentration (ml/l) at 30 meters during WEBSEC-71, August-September, 1971.

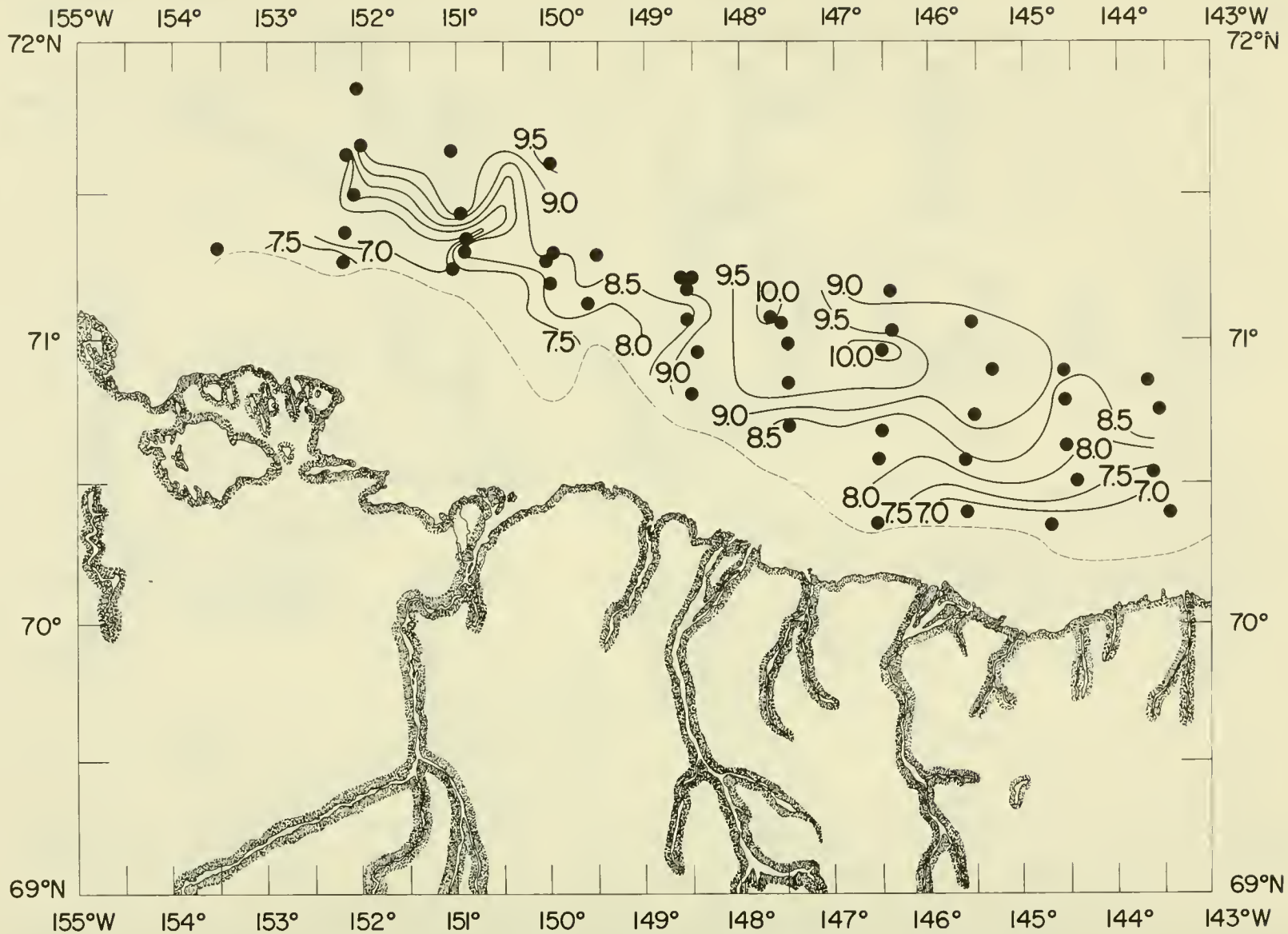

Figure 26.—Dissolved oxygen concentration (ml/l) at 30 meters during WEBSEC-72, August-September, 1972.

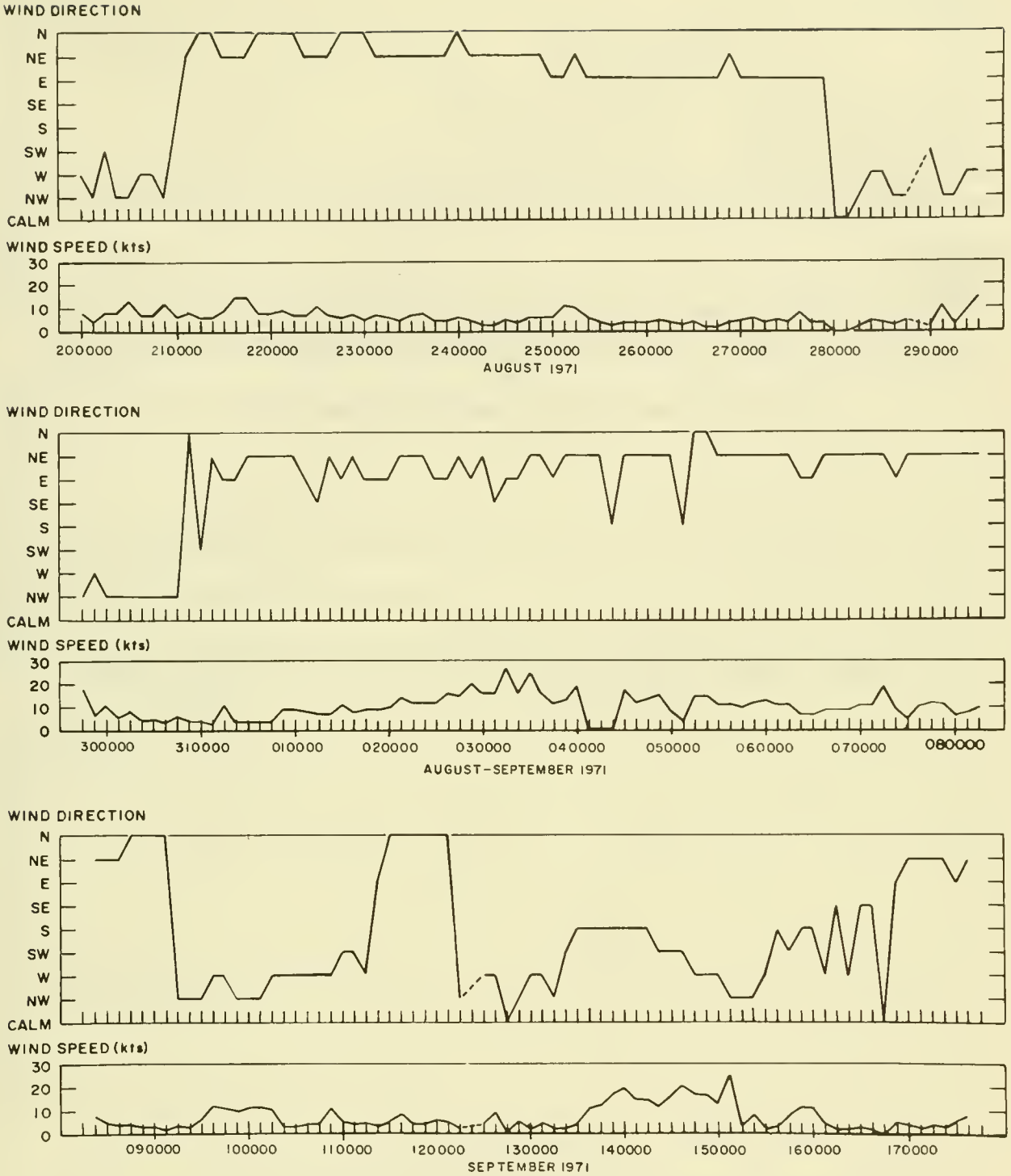

Figure 27.—Surface wind velocity (kts) during WEBSEC-71, August-September, 1971.

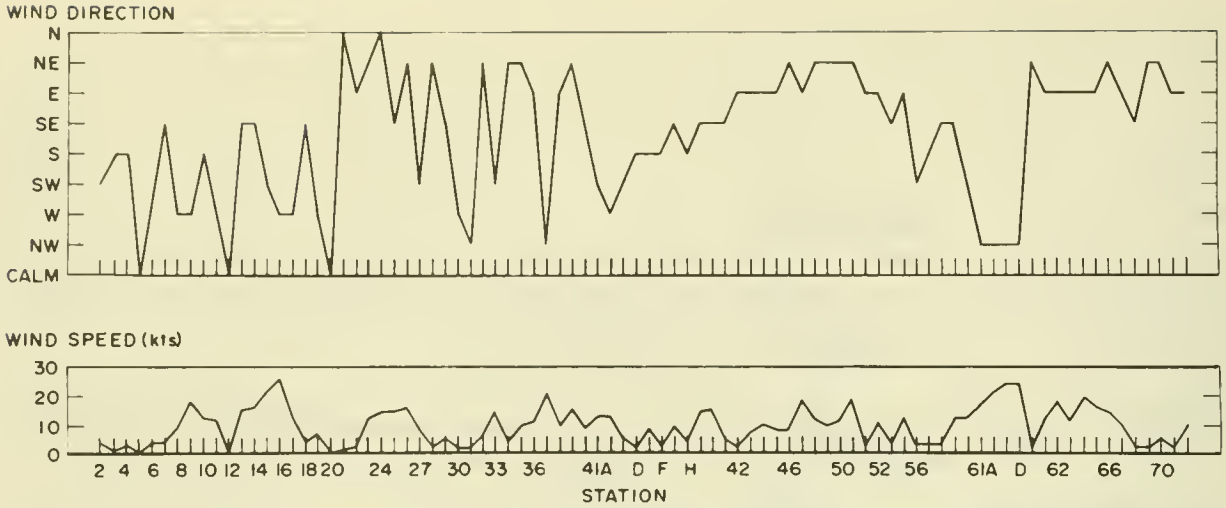

Figure 28.—Surface wind velocity (kts) during WEBSEC-72, August-September, 1972.

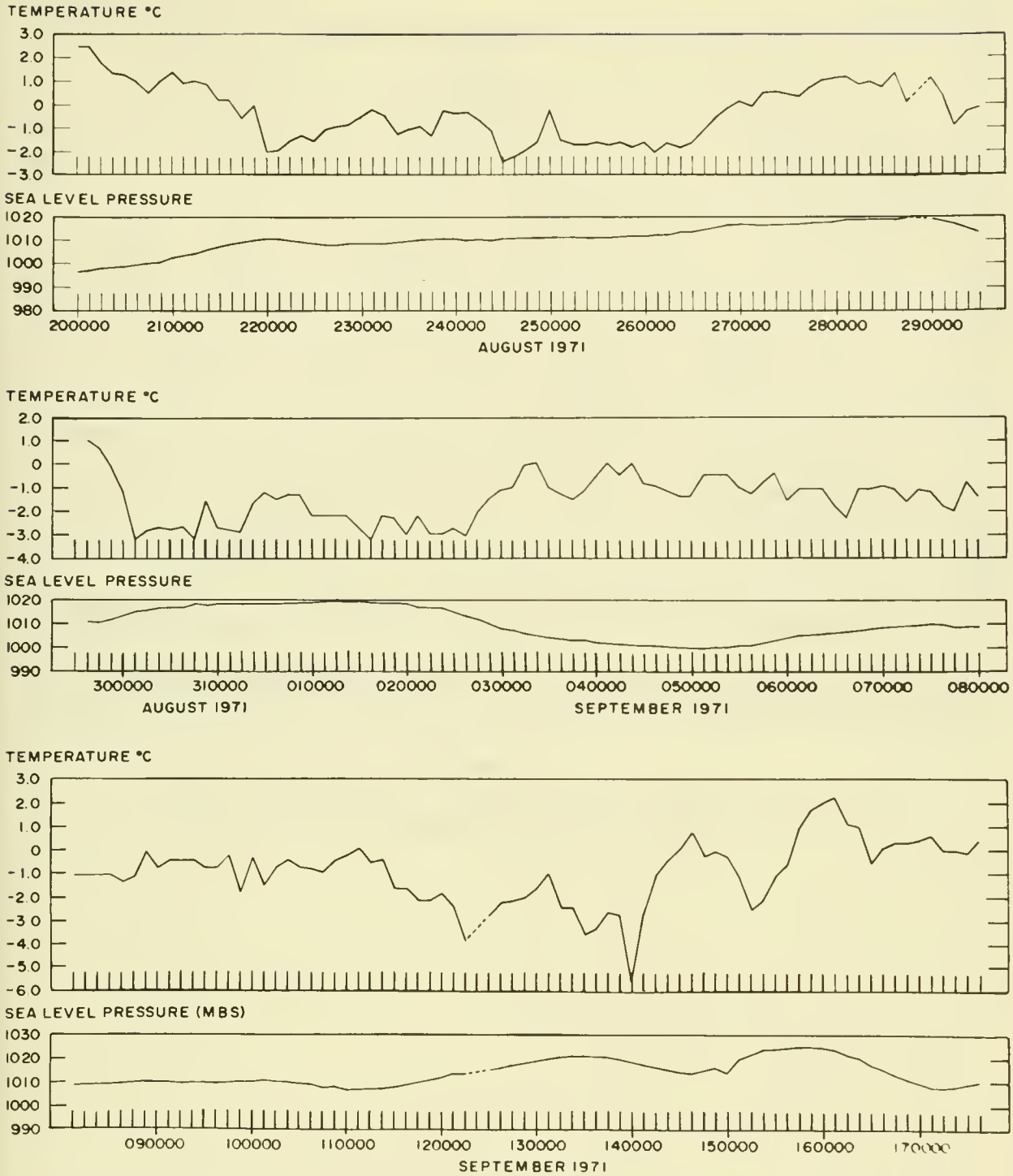

Figure 29.—Surface air temperature (°C) and barometric pressure (mb) during WEBSEC-71, August-September, 1971.

Figure 30.—Surface air temperature (°C) and barometric pressure (mb) during WEBSEC-72, August-September, 1972.

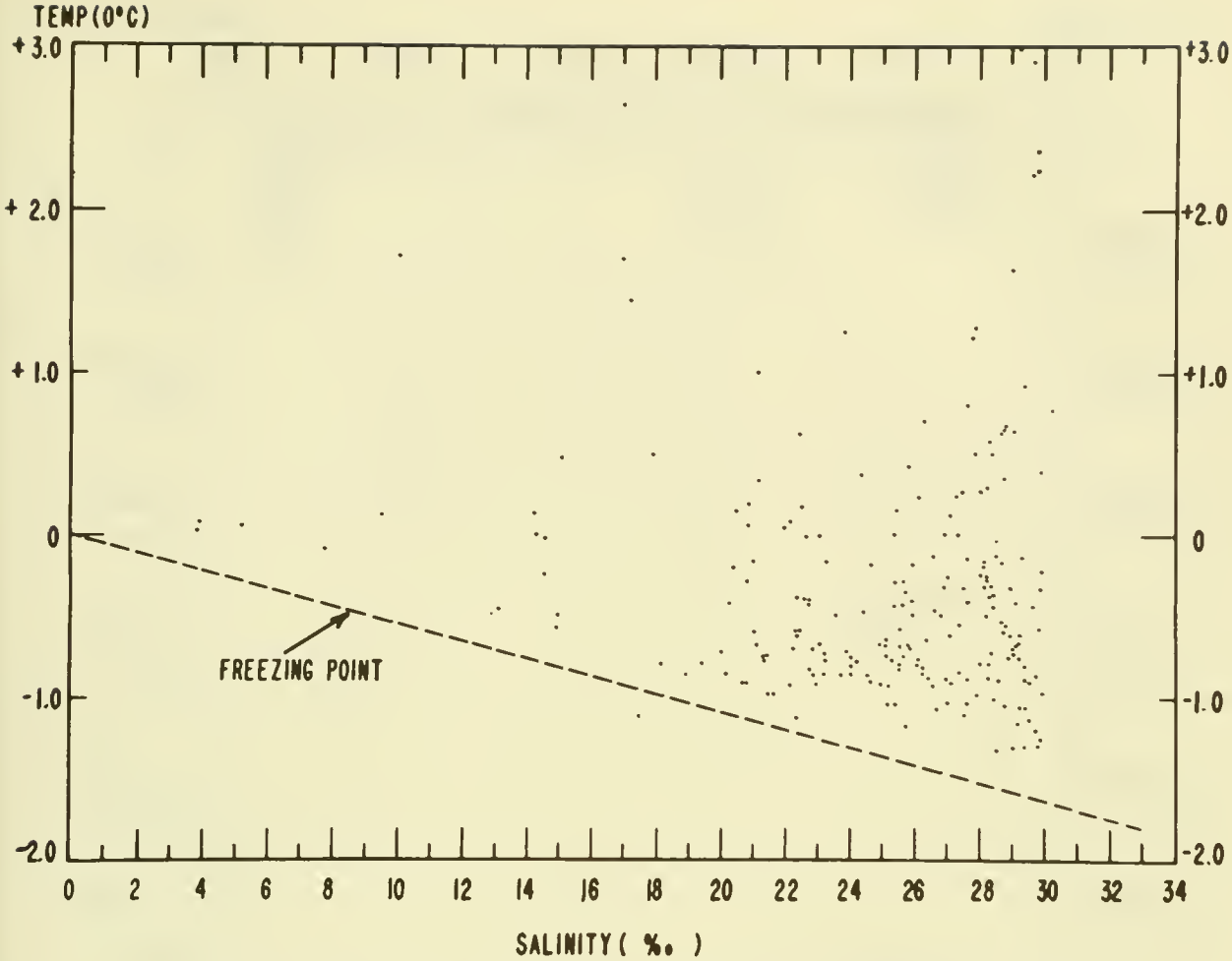

Figure 31.—Temperature (°C) versus salinity (‰) of the upper 100 meters of the water column during WEBSEC-71, August-September, 1971.

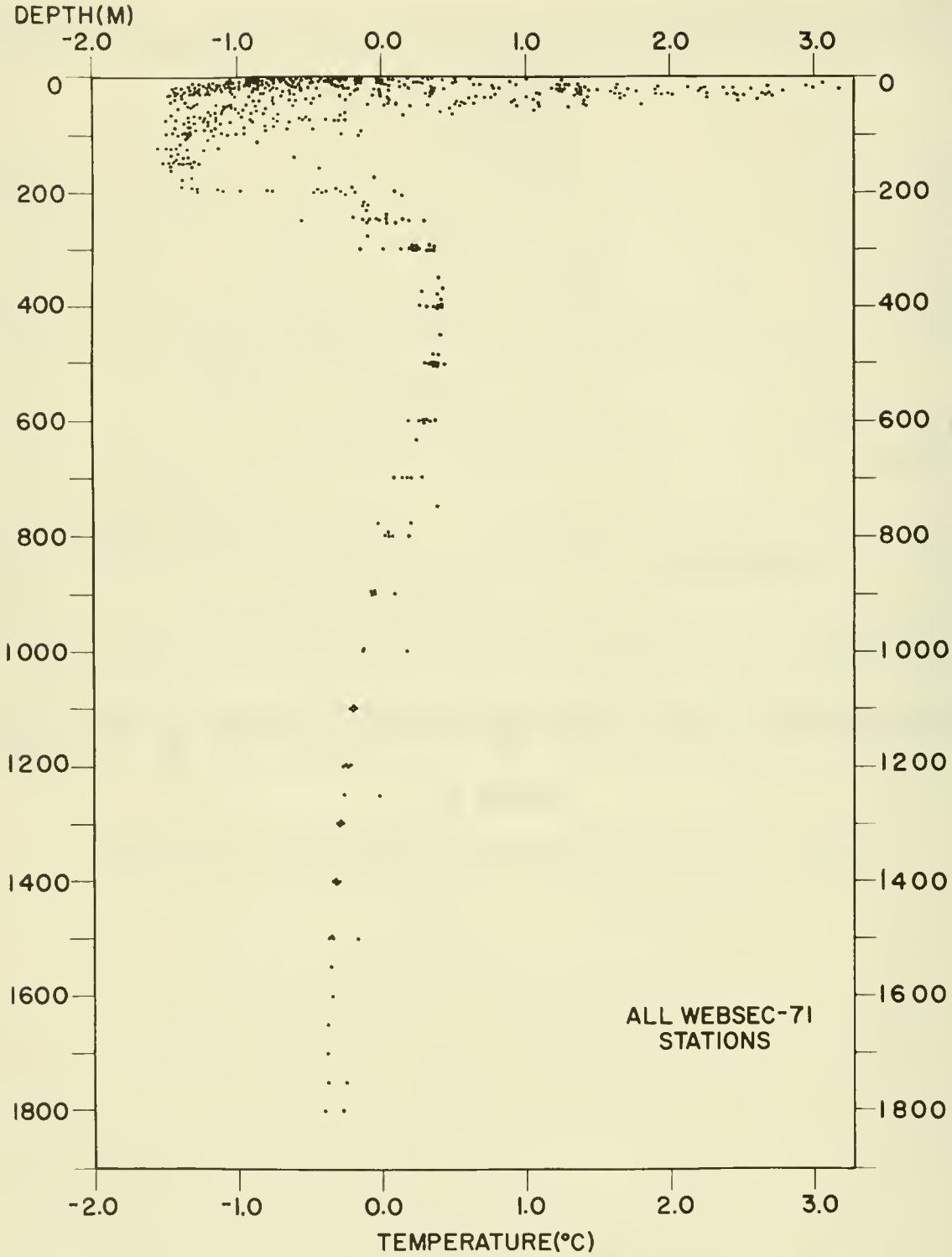

Figure 32.—Observed temperature (°C) versus depth for all stations taken during WEBSEC-71, August-September, 1971.

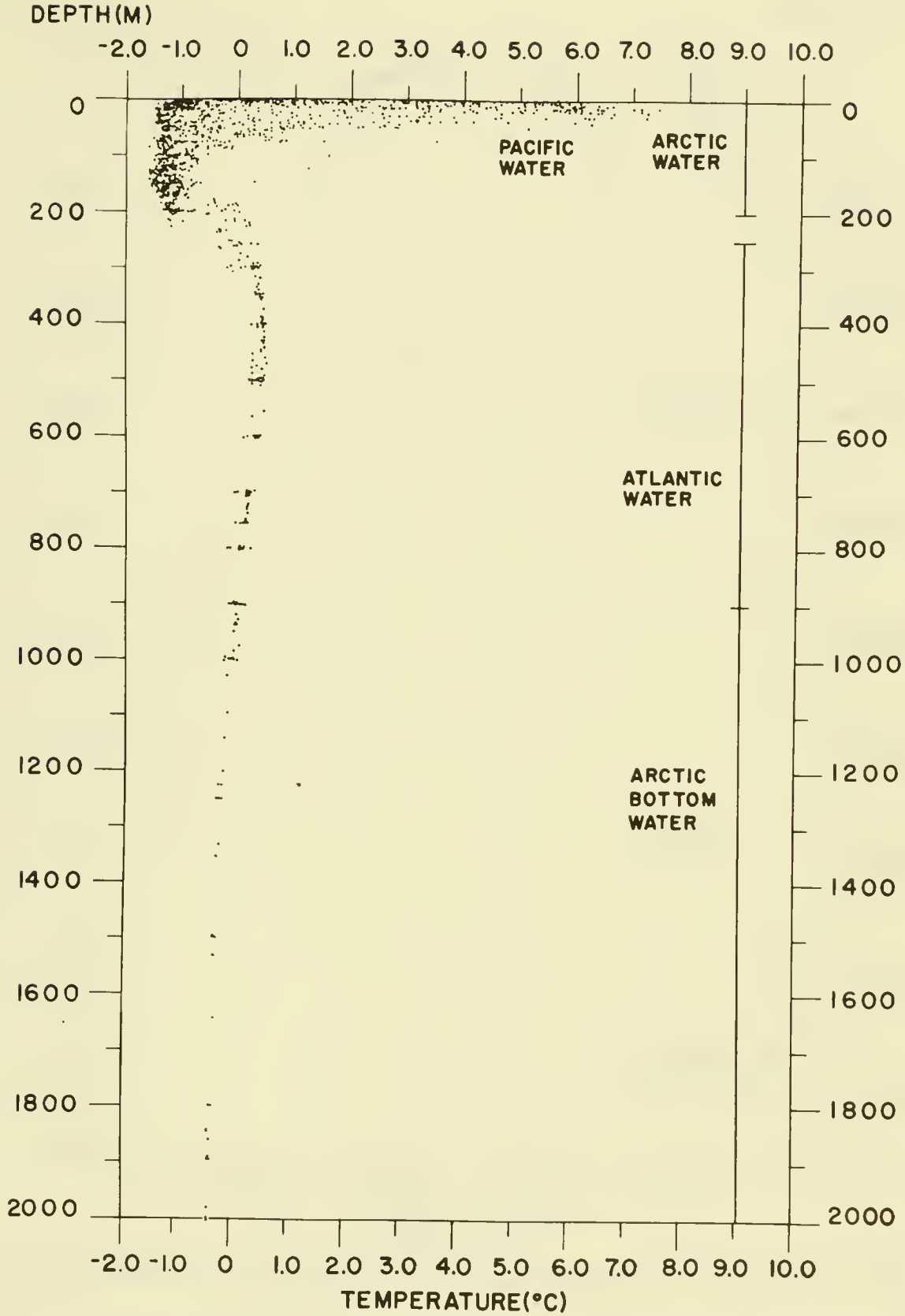

Figure 33.—Observed temperature (°C) versus depth for all stations taken during WEBSEC-72, August-September, 1972.

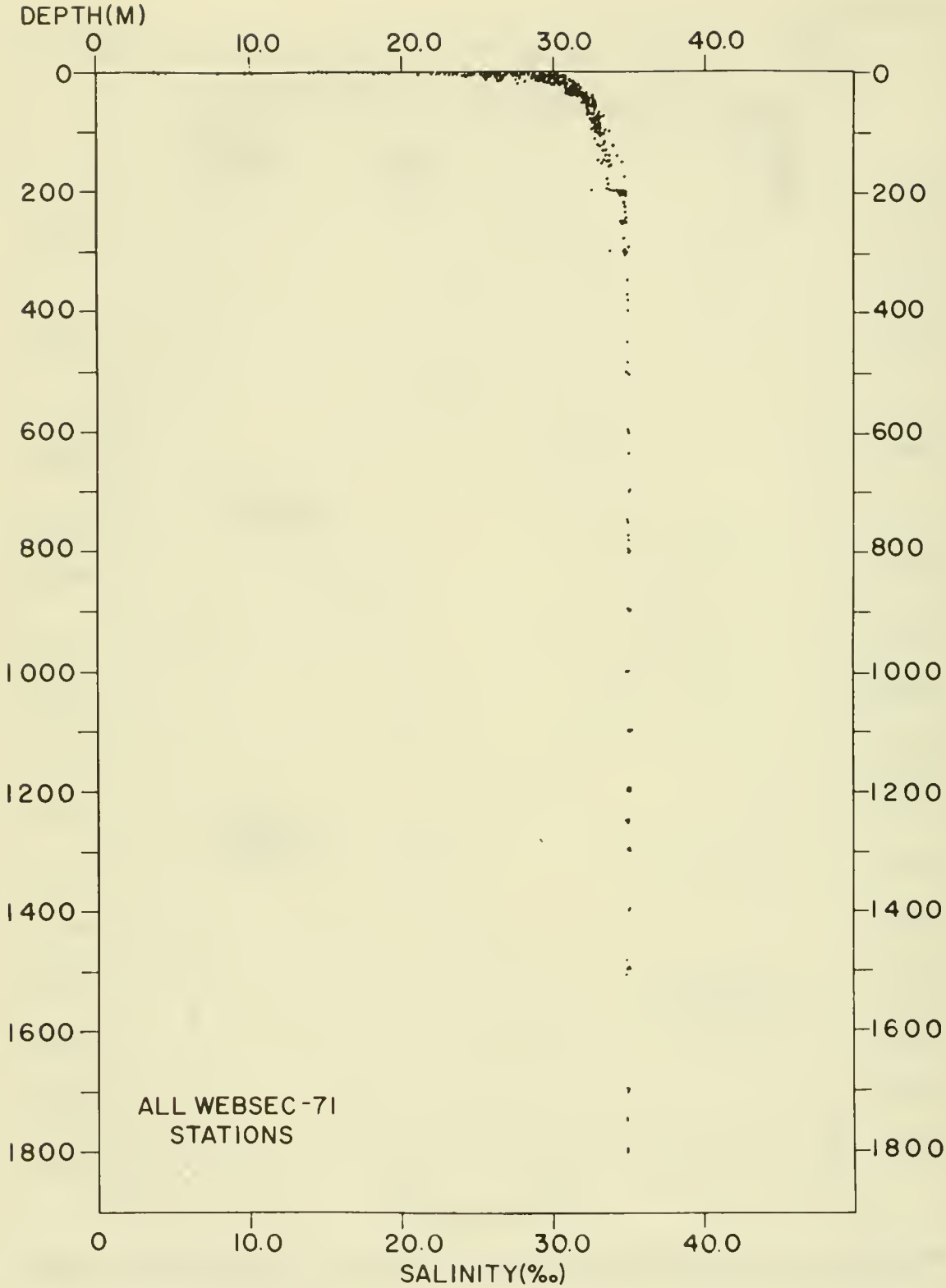

Figure 34.—Observed salinity (‰) versus depth for all stations taken during WEBSEC-71, August-September, 1971.

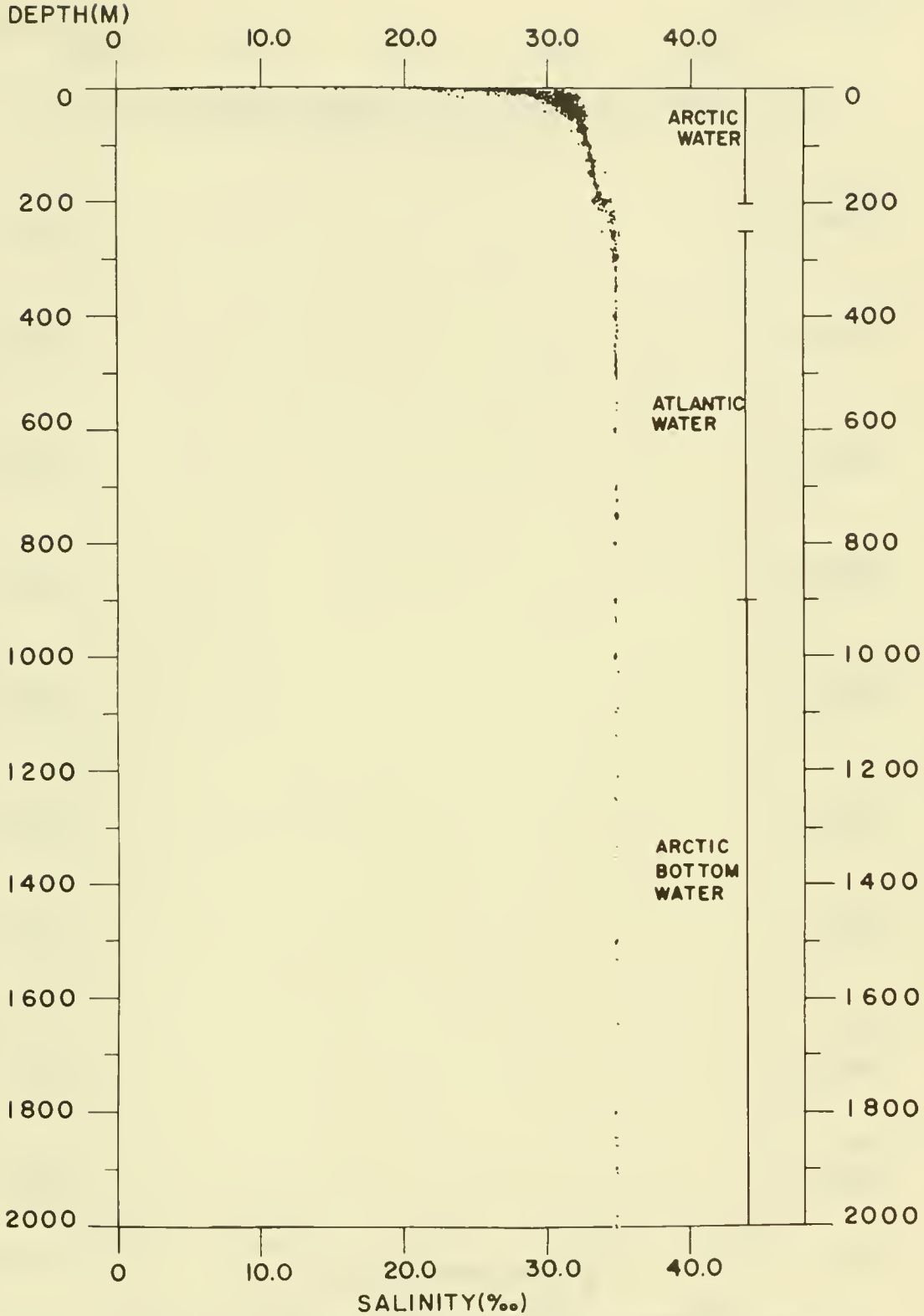

Figure 35.—Observed salinity (‰) versus depth for all stations taken during WEBSEC-71, August-September, 1972.

Figure 36.—Dissolved oxygen concentration (ml/l) versus depth for all stations taken during WEBSEC-71, August-September, 1971.

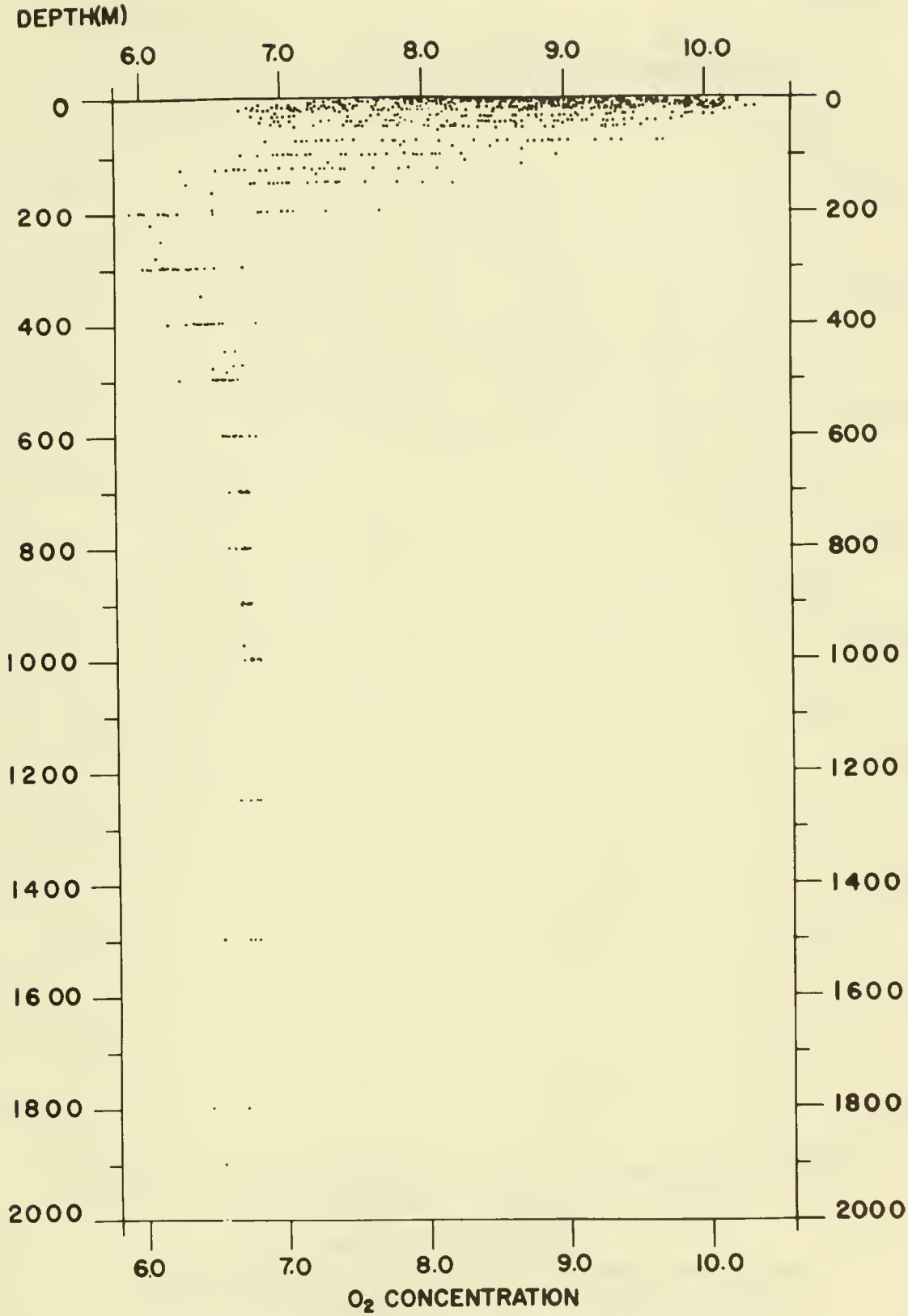

Figure 37.—Dissolved oxygen concentration (ml/l) versus depth for all stations taken during WEBSEC-72, August-September, 1972

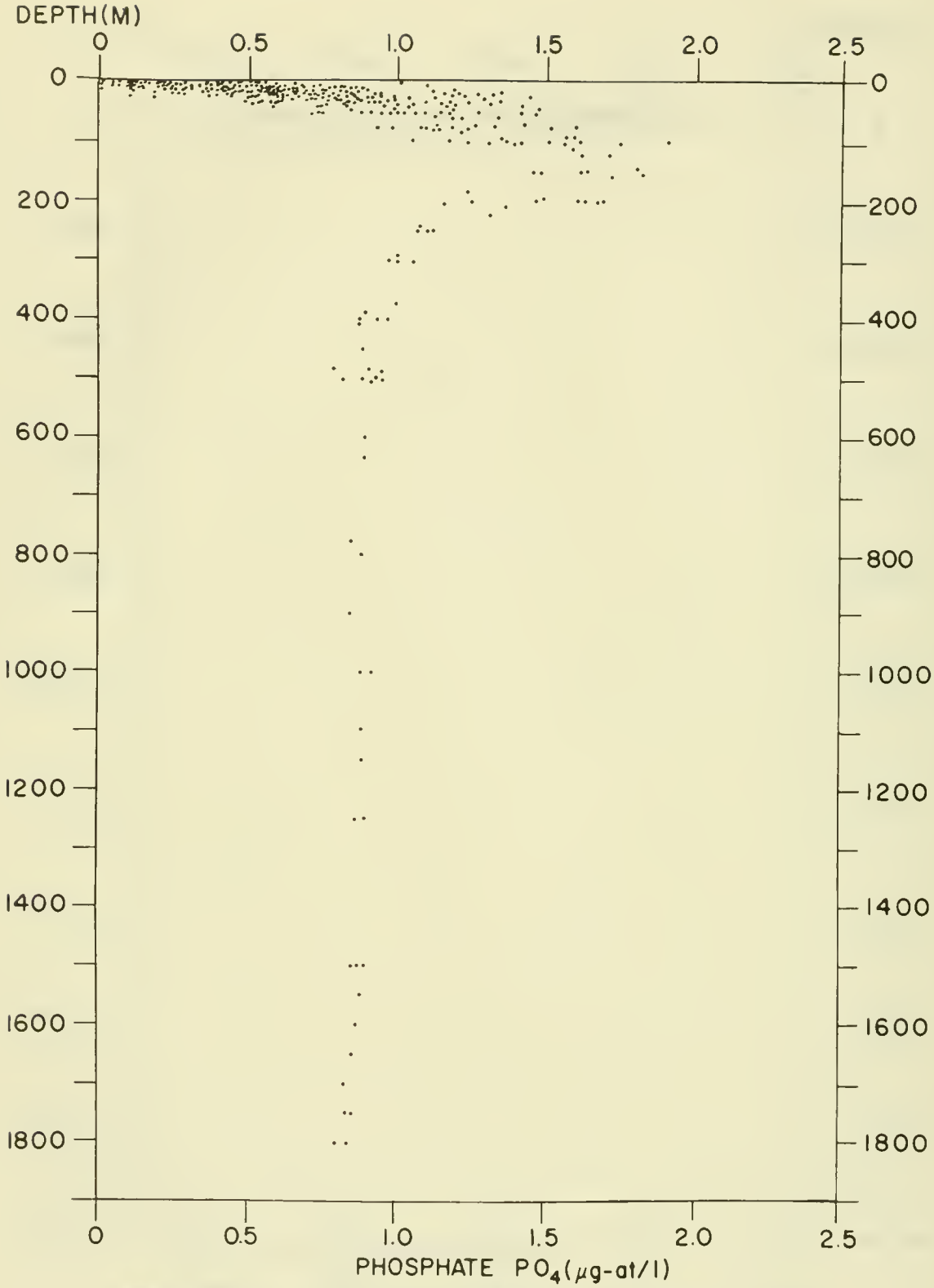

Figure 38.—Dissolved inorganic phosphate (μg-at/l) versus depth for all stations taken during WEBSEC-71, August-September, 1971.

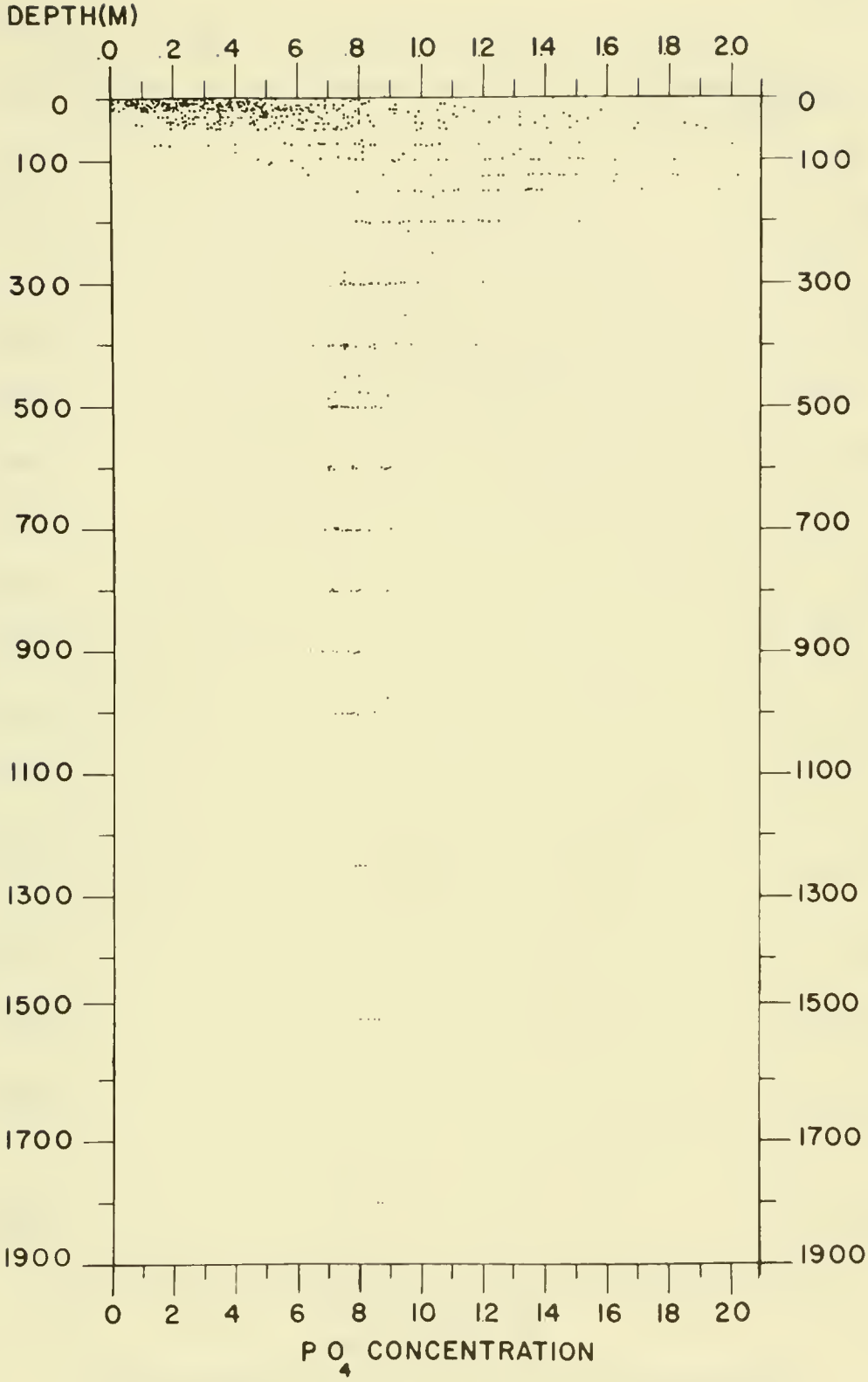

Figure 39.—Dissolved inorganic phosphate (μg-at/l) versus depth for all stations taken during WEBSEC-72, August-September, 1972.

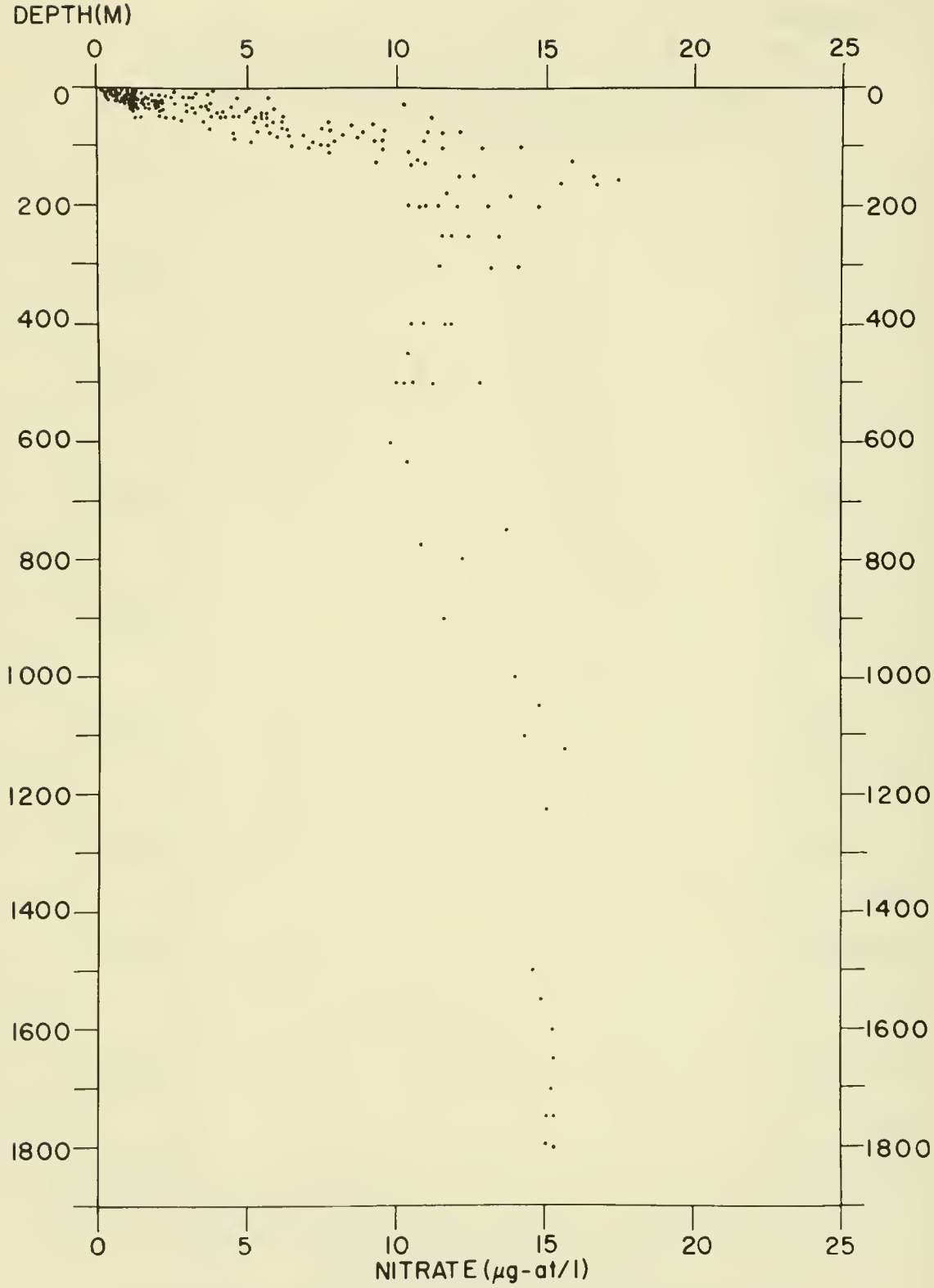

Figure 40.—Dissolved inorganic nitrate (μg-at/l) versus depth for all stations taken during WEBSEC-71, August-September, 1971.

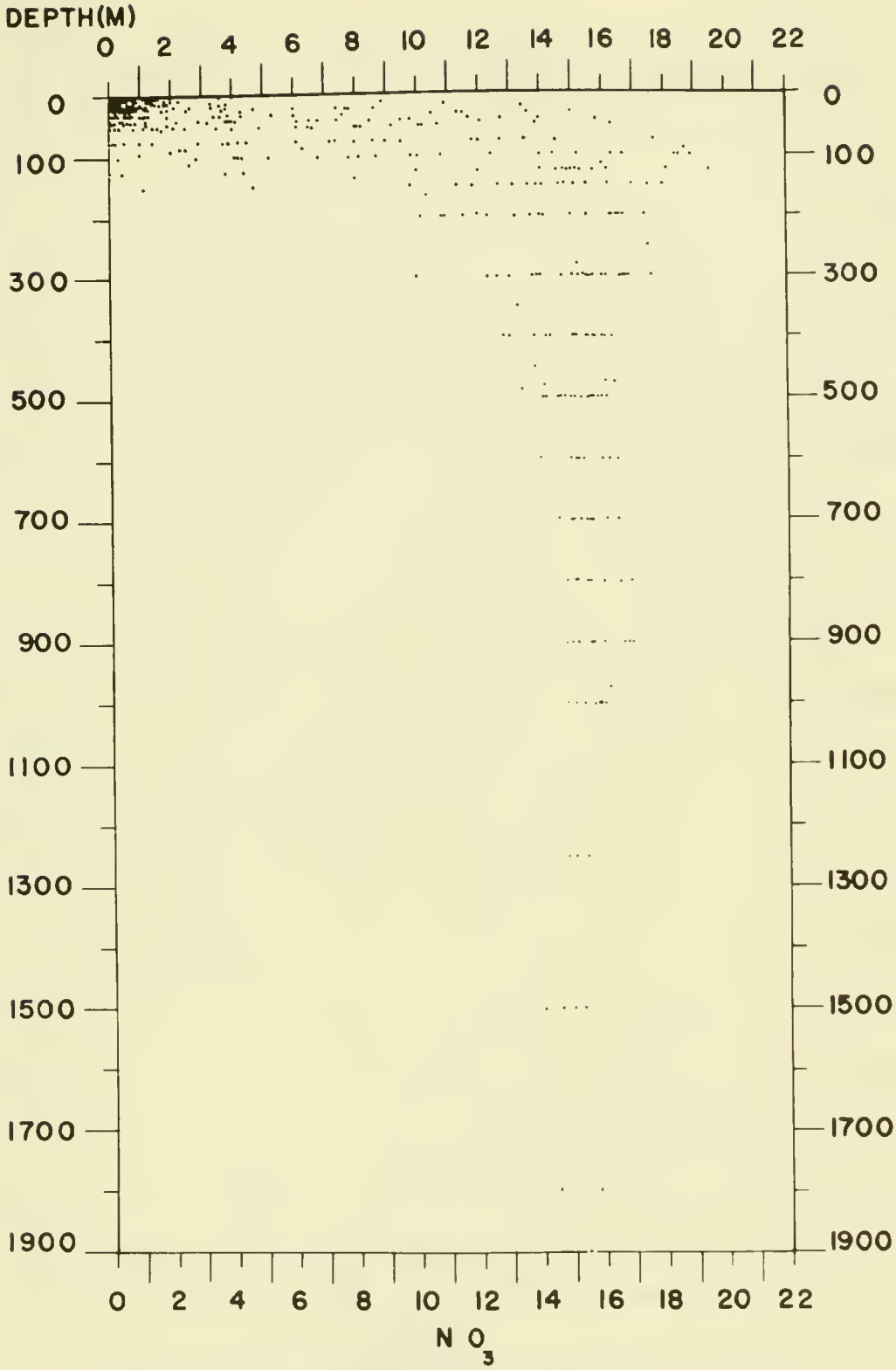

Figure 41.—Dissolved inorganic nitrate (μg-at/l) versus depth for all stations taken during WEBSEC-72, August-September, 1972.

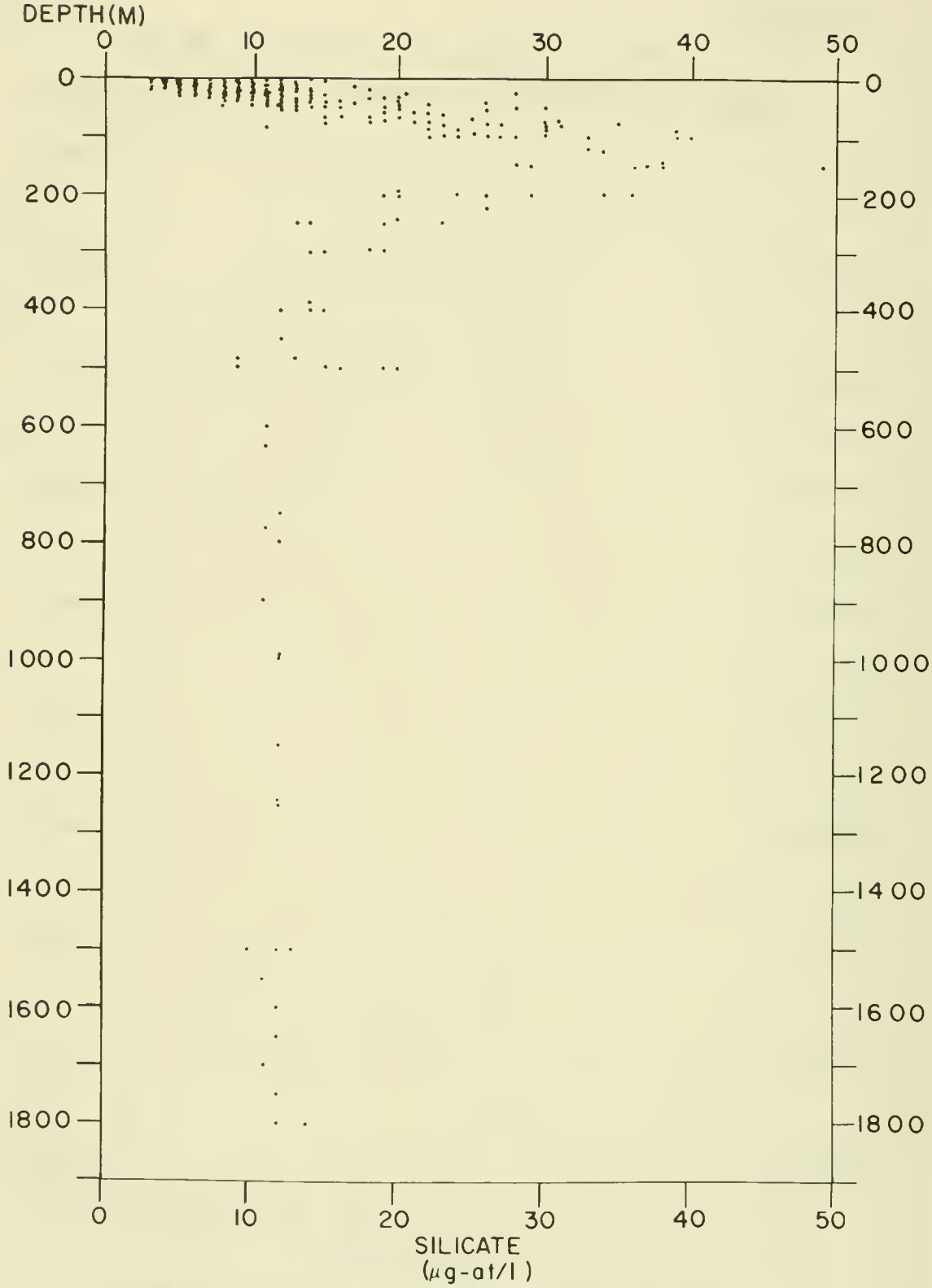

Figure 42.—Dissolved inorganic silicate (μg-at/l) versus depth for all stations taken during WEBSEC-71, August-September, 1971.

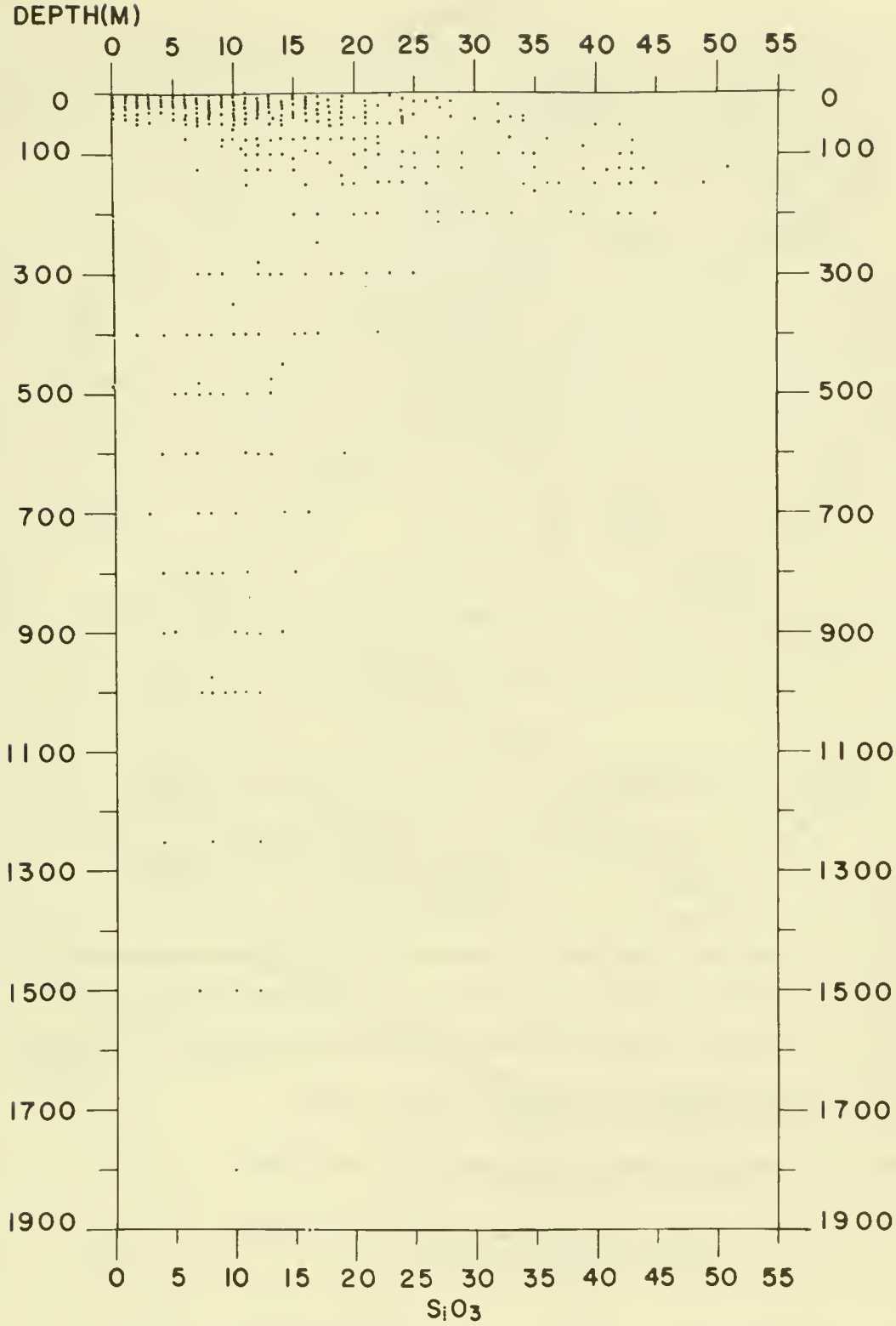

Figure 43.—Dissolved inorganic silicate (μg-at/l) versus depth for all stations taken during WEBSEC-72, August-September, 1972.

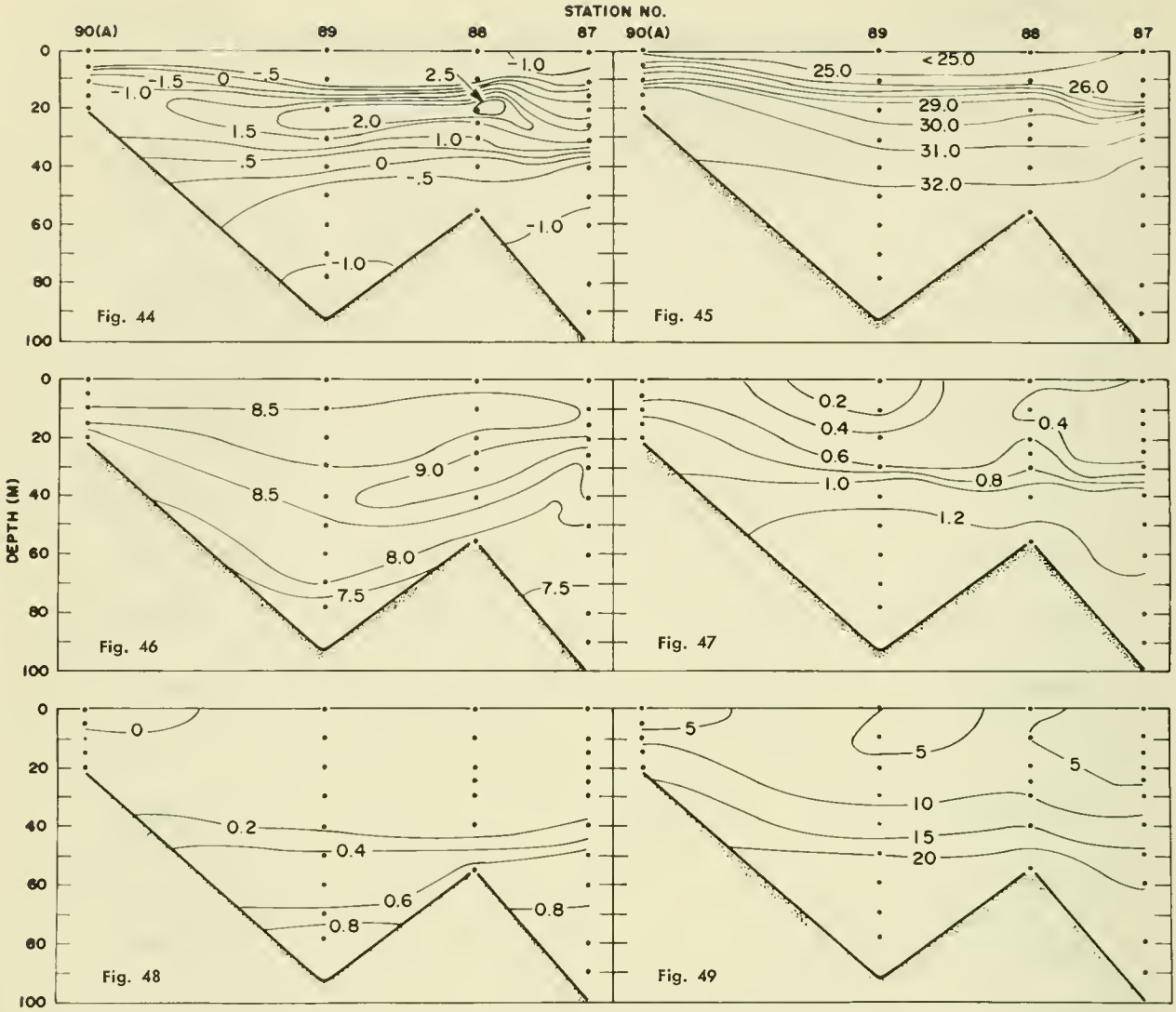

Figure 44.—Vertical profile of temperature (°C) along section A during WEBSEC-71, August-September, 1971.

Figure 45.—Vertical profile of salinity (°/oo) along section A during WEBSEC-71, August-September, 1971.

Figure 46.—Vertical profile of dissolved oxygen (ml/l) along section A during WEBSEC-71; August-September, 1971.

Figure 47.—Vertical profile of inorganic phosphate (μg-at/l) along section A during WEBSEC-71, August-September, 1971.

Figure 48.—Vertical profile of inorganic nitrate (μg-at/l) along section A during WEBSEC-71, August-September, 1971.

Figure 49. Vertical profile of inorganic silicate (μg-at/l) ALONG SECTION A during WEBSEC-71, August-September, 1971.

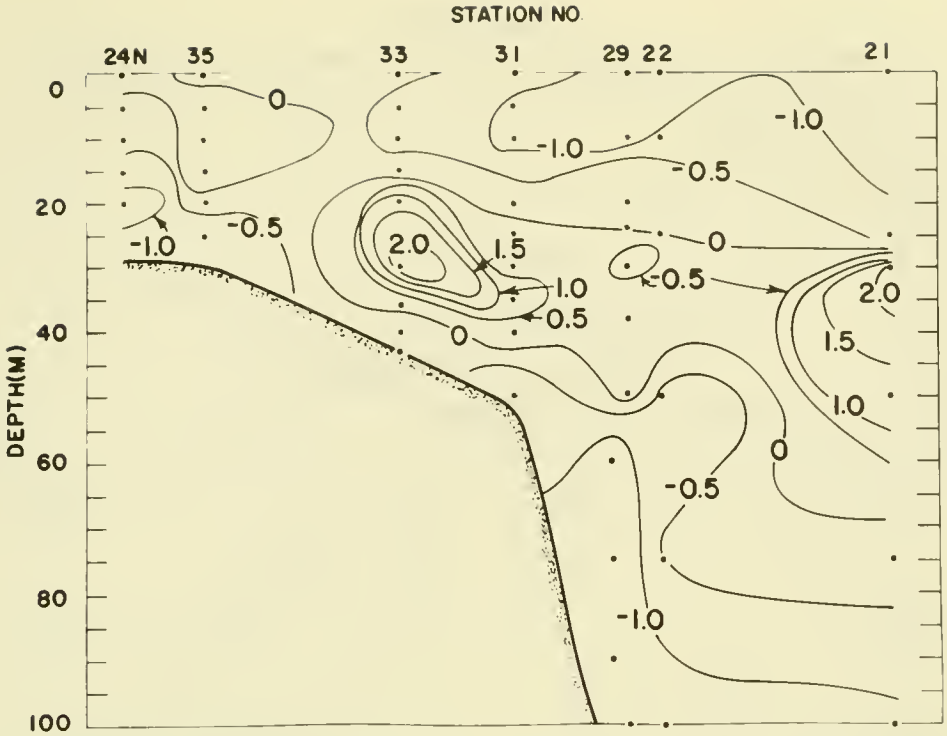

Figure 50.—Vertical profile of temperature (°C) to 100 meters along section B during WEBSEC-71, August-September, 1971.

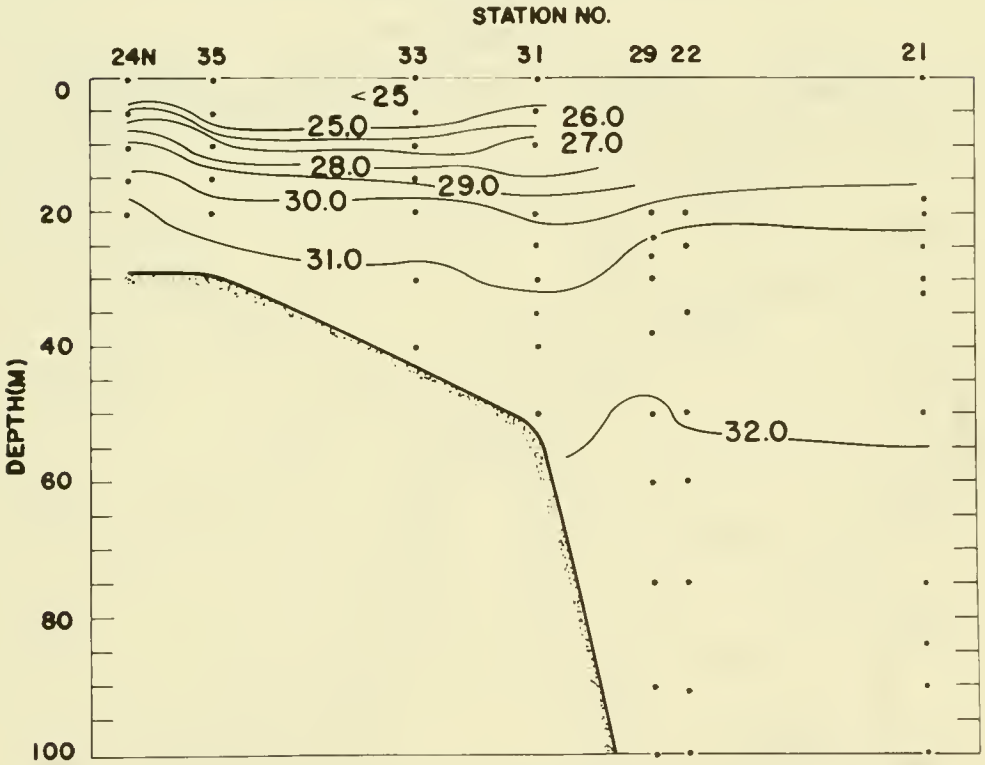

Figure 51.—Vertical profile of salinity (‰) to 100 meters along section B during WEBSEC-71, August-September, 1971.

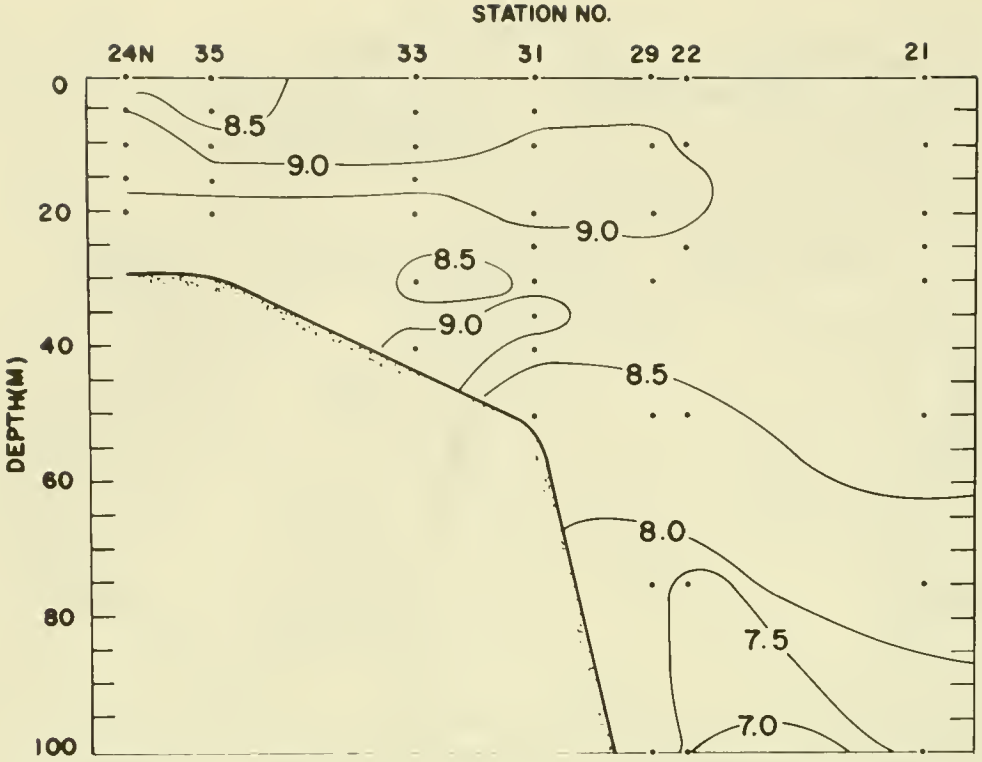

Figure 52.—Vertical profile of dissolved oxygen (ml/l) to 100 meters along section B during WEBSEC-71, August-September, 1971.

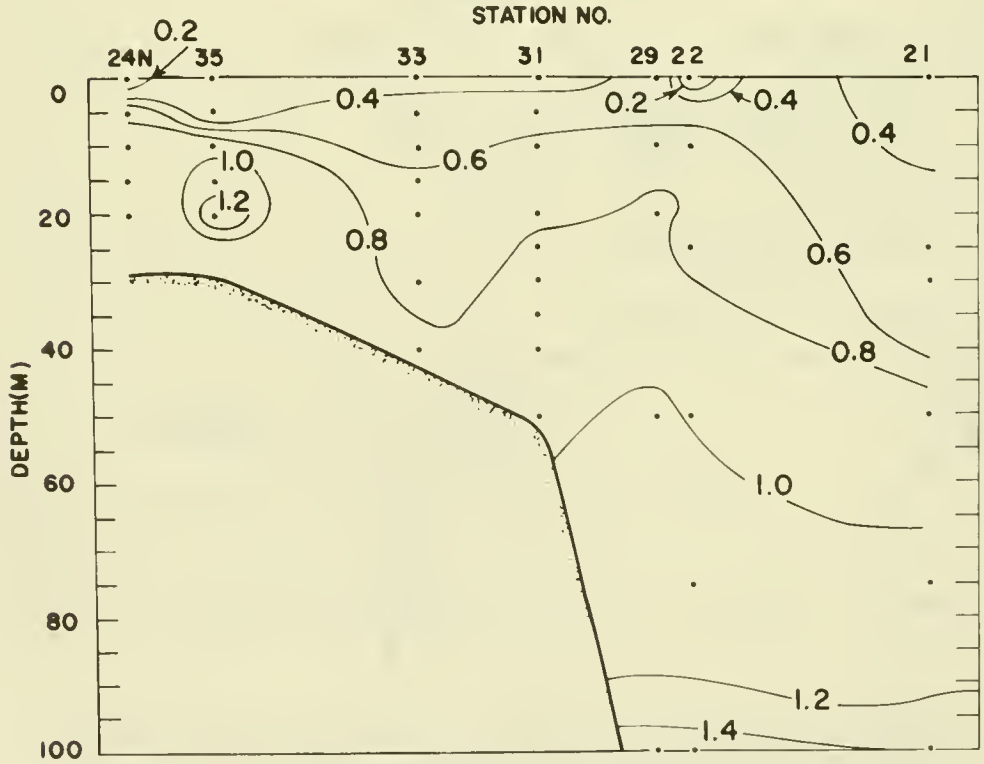

Figure 53.—Vertical profile of inorganic phosphate (μg-at/l) to 100 meters along section B during WEBSEC-71, August-September, 1971.

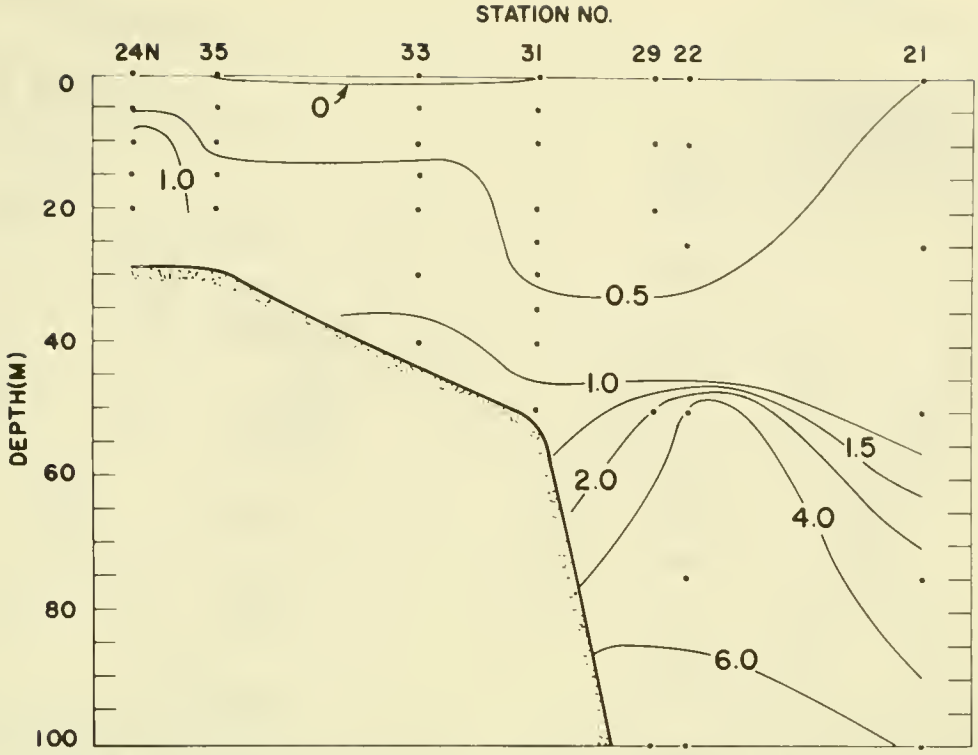

Figure 54.—Vertical profile of inorganic nitrate (μg-at/l) to 100 meters along section B during WEBSEC-71, August-September, 1971.

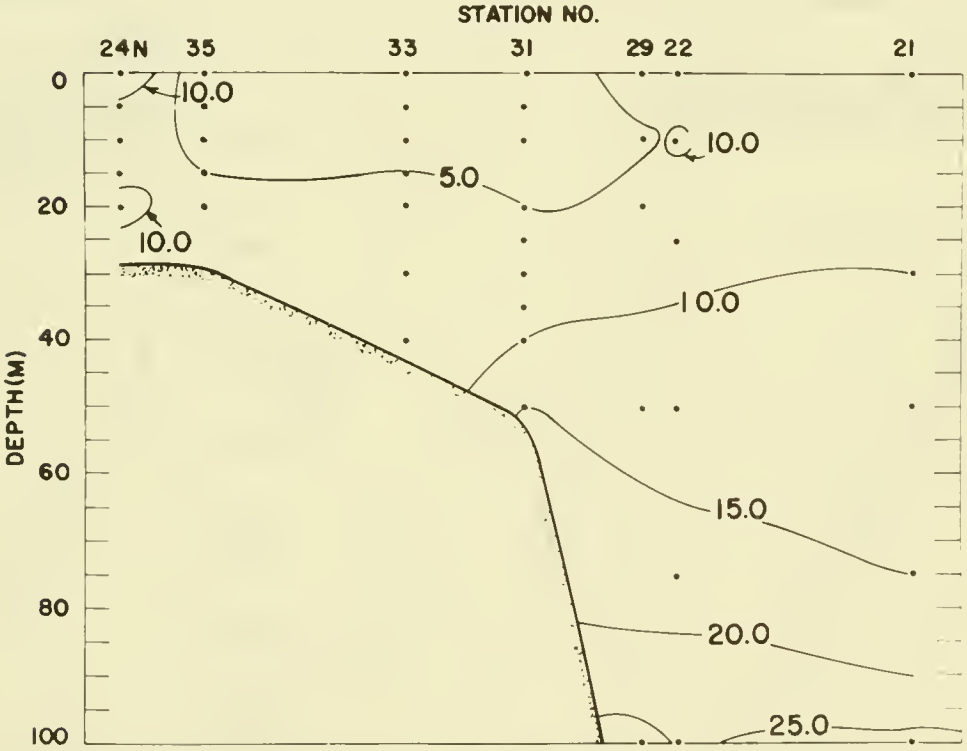

Figure 55.—Vertical profile of inorganic silicate (μg-at/l) to 100 meters along section B during WEBSEC-71, August-September, 1971.

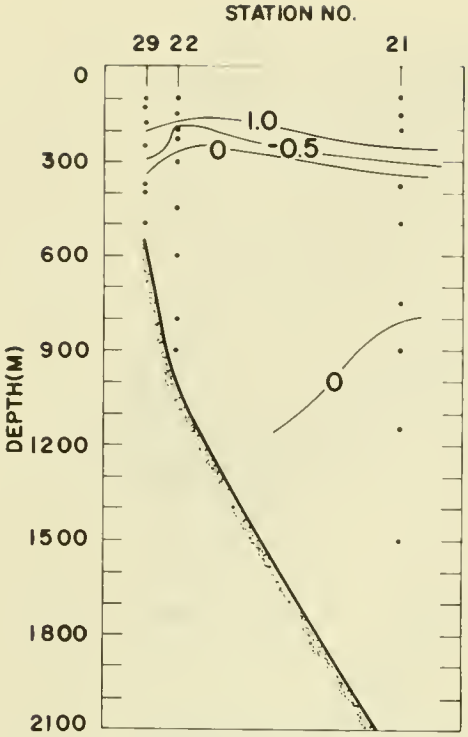

Figure 56.—Vertical profile of temperature (°C) from 100 meters to bottom along section B during WEBSEC-71, August-September, 1971.

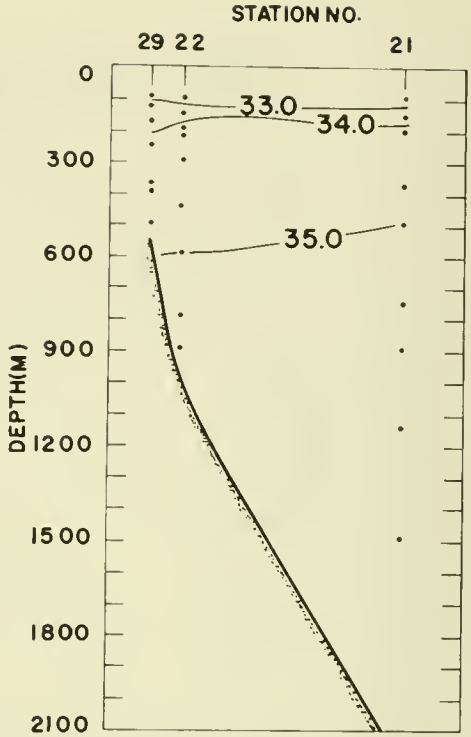

Figure 57.—Vertical profile of salinity (‰) from 100 meters to bottom along section B during WEBSEC-71, August-September, 1971.

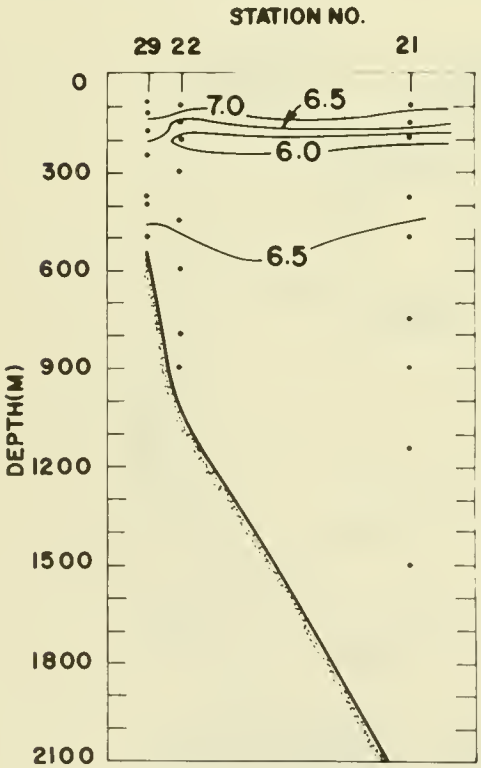

Figure 58.—Vertical profile of dissolved oxygen (ml/l) from 100 meters to bottom along section B during WEBSEC-71, August-September, 1971.

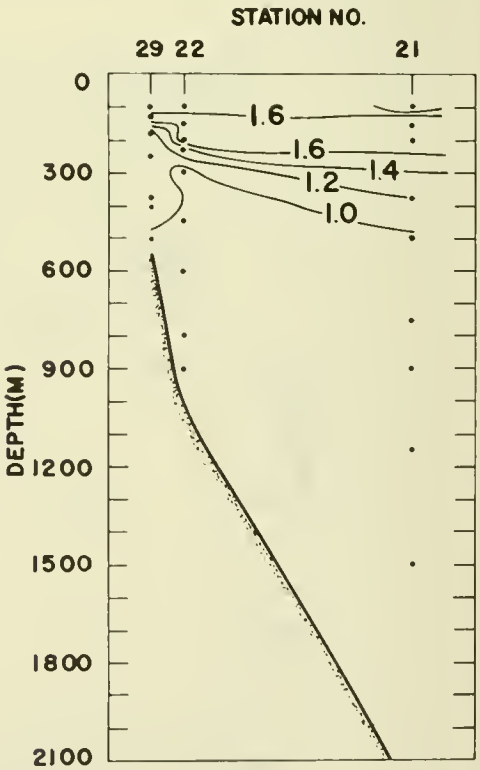

Figure 59.—Vertical profile of inorganic phosphate (μg-at/l) from 100 meters to bottom along section B during WEBSEC-71, August-September, 1971.

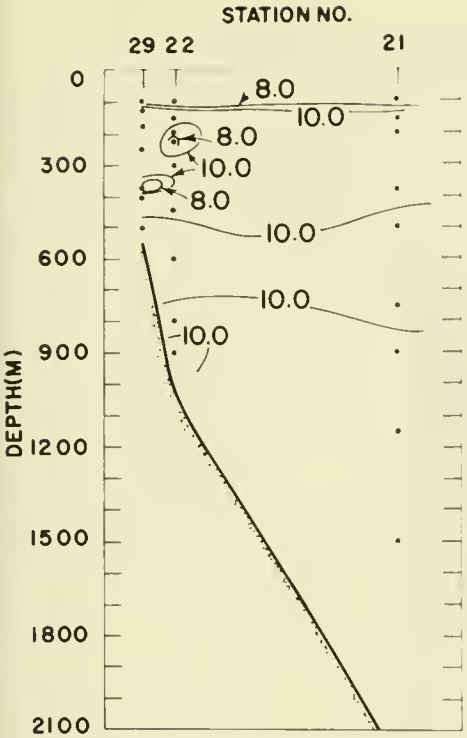

Figure 60.—Vertical profile of inorganic nitrate (μg-at/l) from 100 meters to bottom along section B during WEBSEC-71, August-September, 1971.

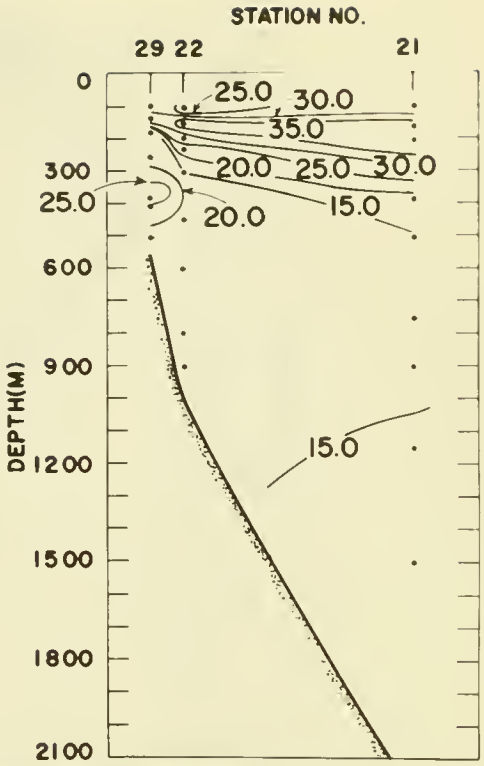

Figure 61.—Vertical profile of inorganic silicate (μg-at/l) from 100 meters to bottom along section B during WEBSEC-71, August-September, 1971.

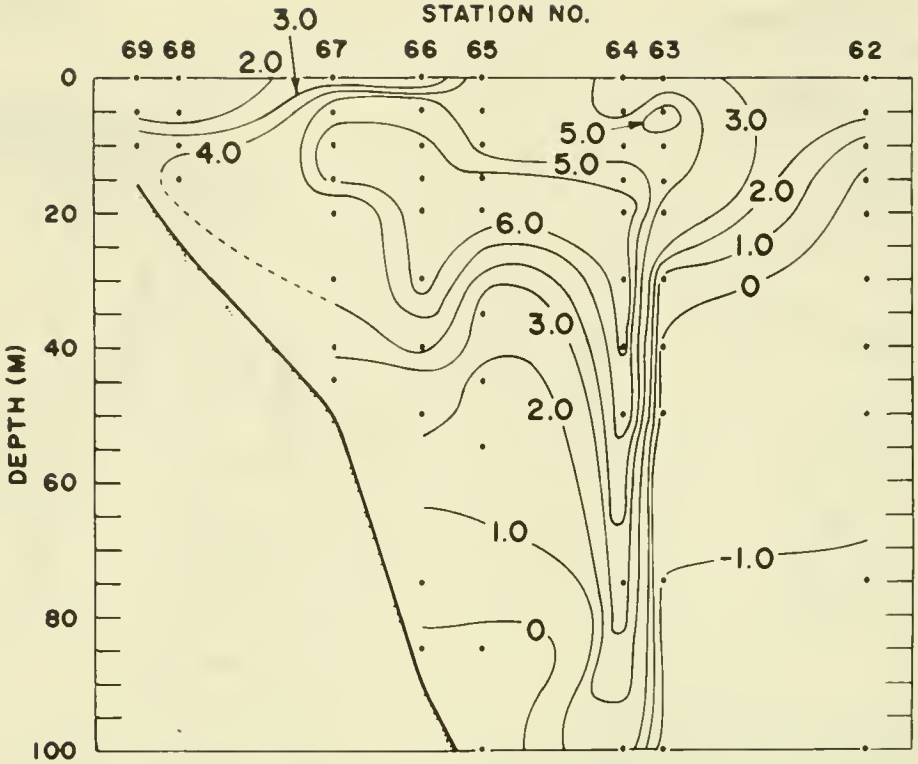

Figure 62.—Vertical profile of temperature (°C) to 100 meters along section A during WEBSEC-72, August-September, 1972.

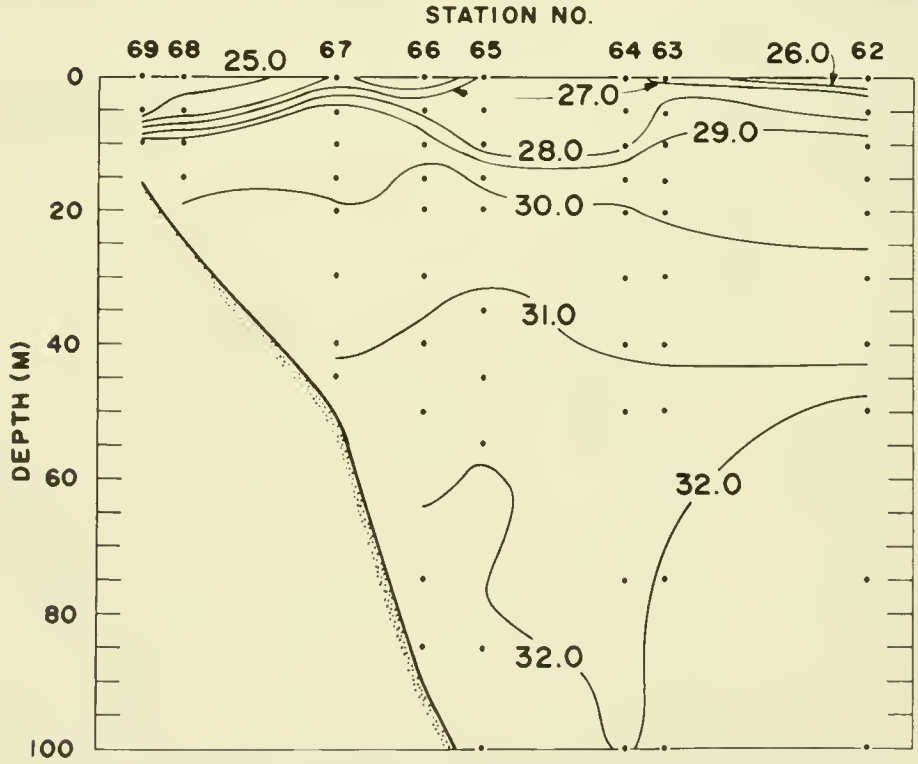

Figure 63.—Vertical profile of salinity (‰) to 100 meters along section A during WEBSEC-72, August-September, 1972.

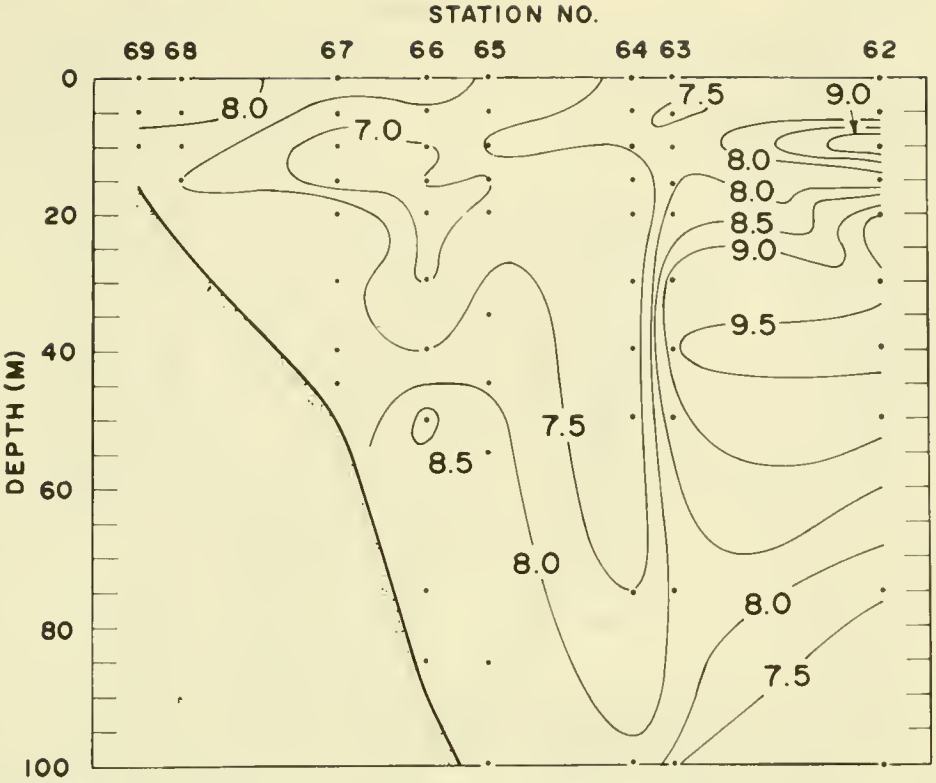

Figure 64.—Vertical profile of dissolved oxygen (ml/l) to 100 meters along section A during WEBSEC-72, August-September, 1972.

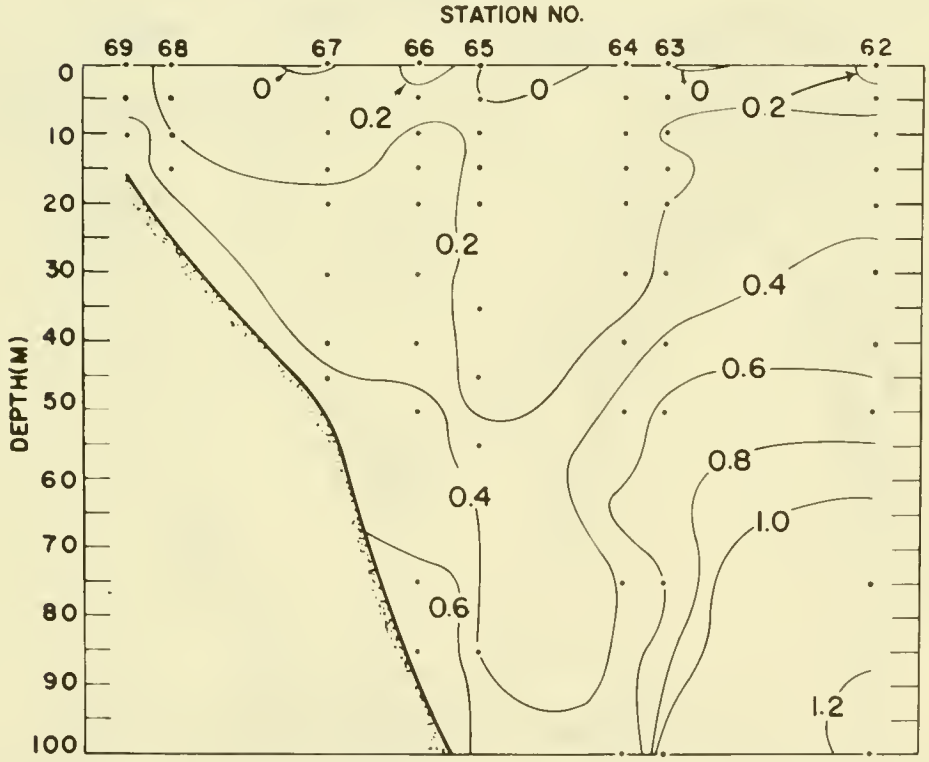

Figure 65.—Vertical profile of inorganic phosphate (μg-at/l) to 100 meters along section A during WEBSEC-72, August-September, 1972.

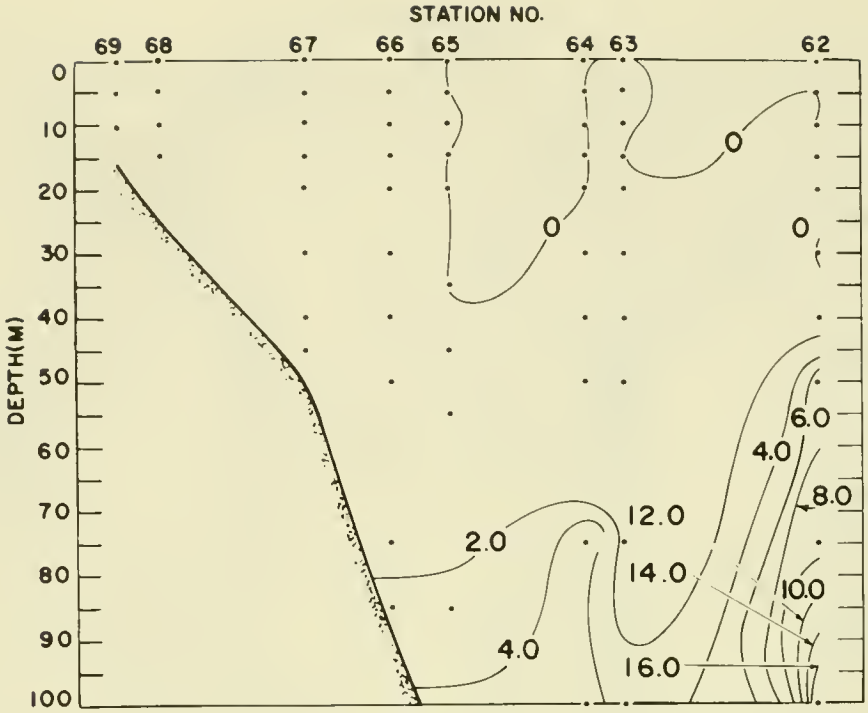

Figure 66.—Vertical profile of inorganic nitrate (μg-at/l) to 100 meters along section A during WEBSEC-72, August-September, 1972.

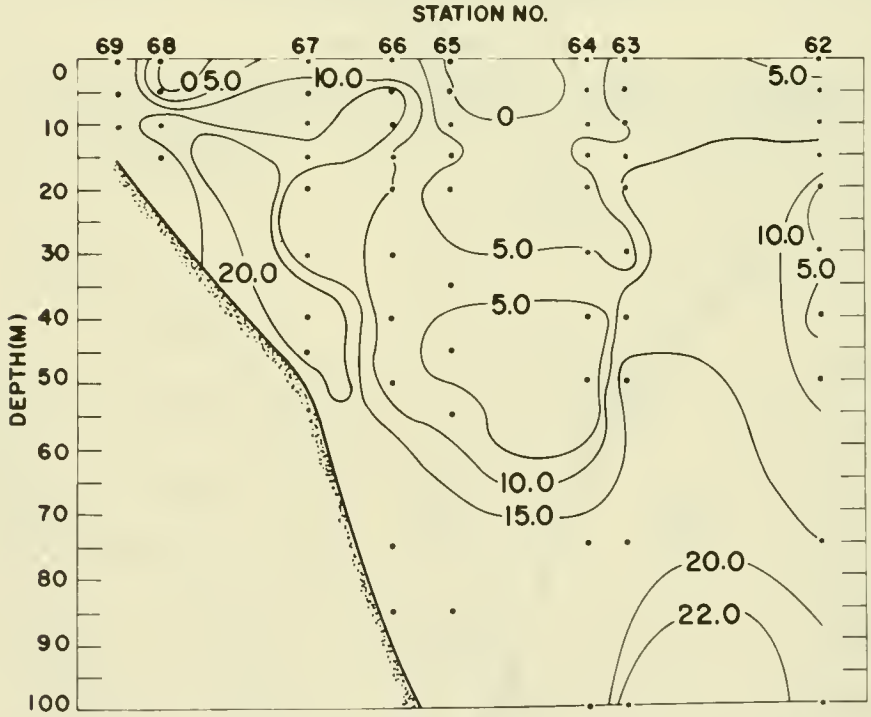

Figure 67.—Vertical profile of inorganic silicate (μg-at/l) to 100 meters along section A during WEBSEC-72, August-September, 1972.

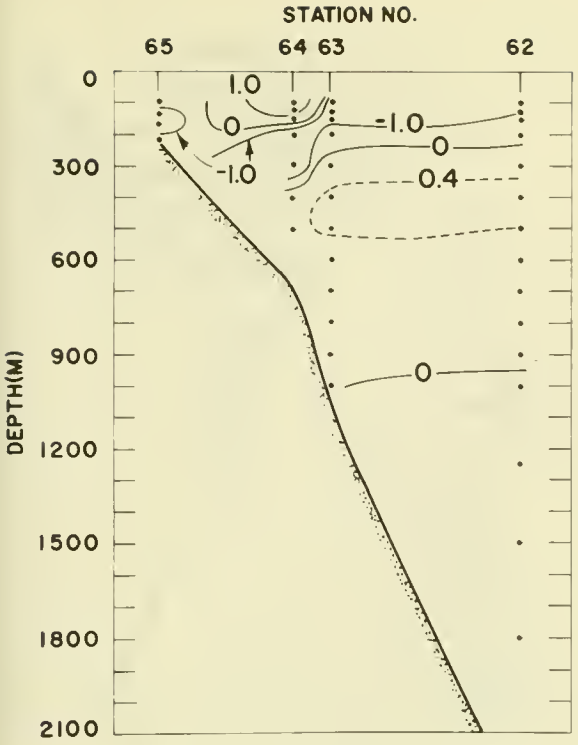

Figure 68.—Vertical profile of temperature (°C) from 100 meters to bottom along section A during WEBSEC-72, August-September, 1972.

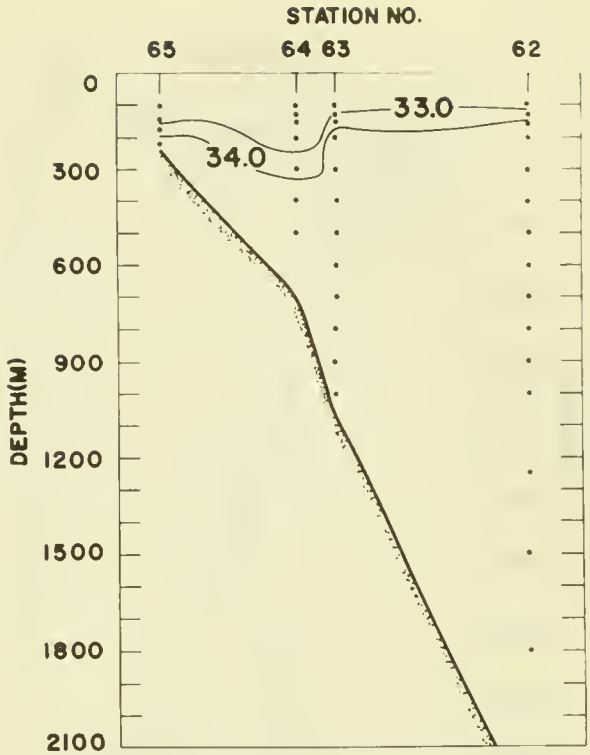

Figure 69.—Vertical profile of salinity (°/oo) from 100 meters to bottom along section A during WEBSEC-72, August-September, 1972.

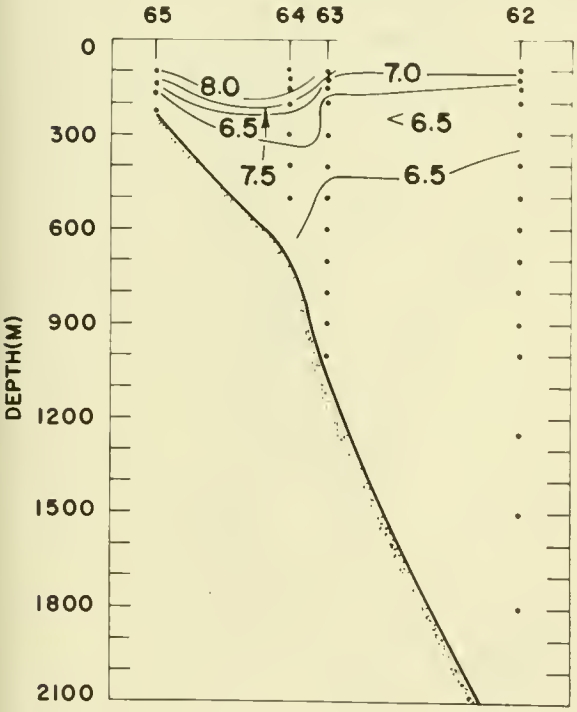

Figure 70.—Vertical profile of dissolved oxygen (ml/l) from 100 meters to bottom along section A during WEBSEC-72, August-September, 1972.

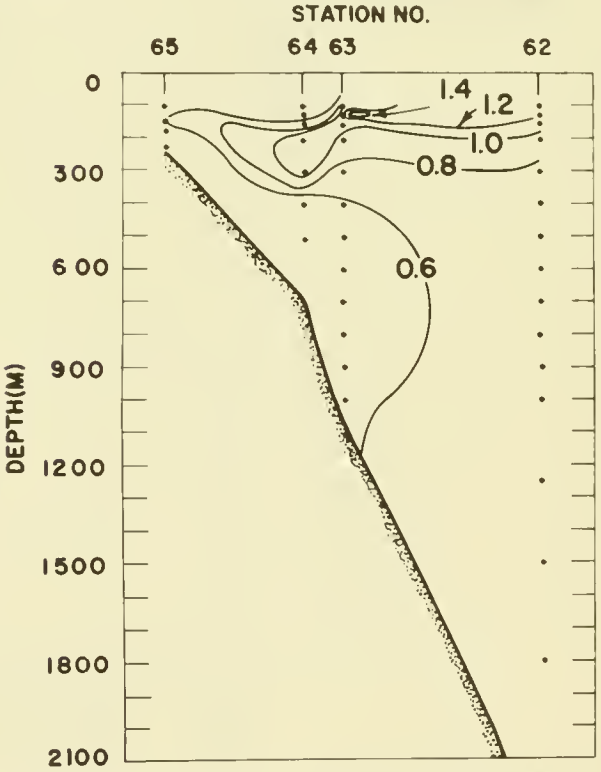

Figure 71.—Vertical profile of inorganic phosphate (μg-at/l) from 100 meters to bottom along section A during WEBSEC-72, August-September, 1972.

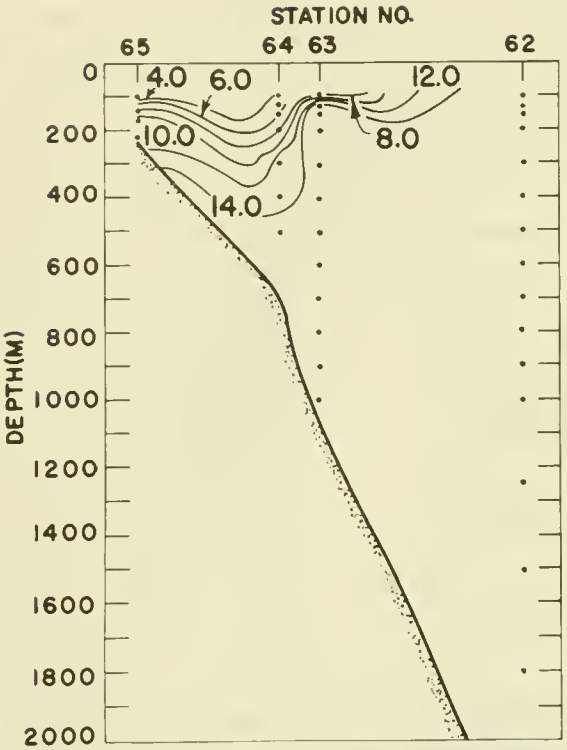

Figure 72.—Vertical profile of inorganic nitrate (μg-at/l) from 100 meters to bottom along section A during WEBSEC-72, August-September, 1972.

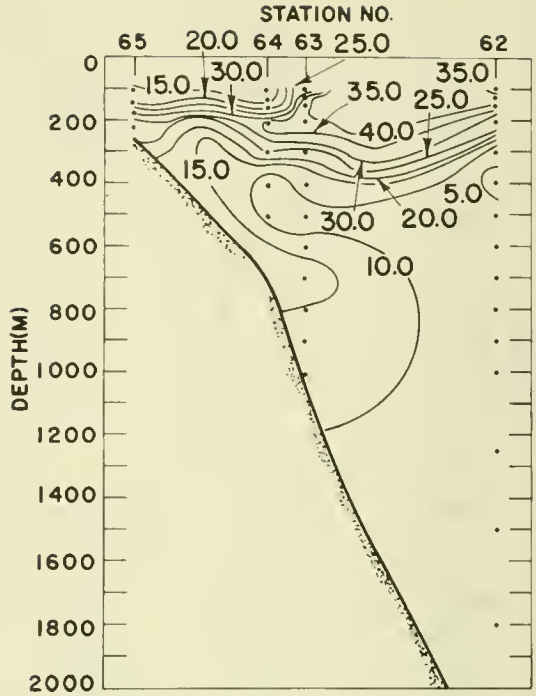

Figure 73. Vertical profile of inorganic silicate (μg-at/l) from 100 meters to bottom along section A during WEBSEC-72, August-September, 1972.

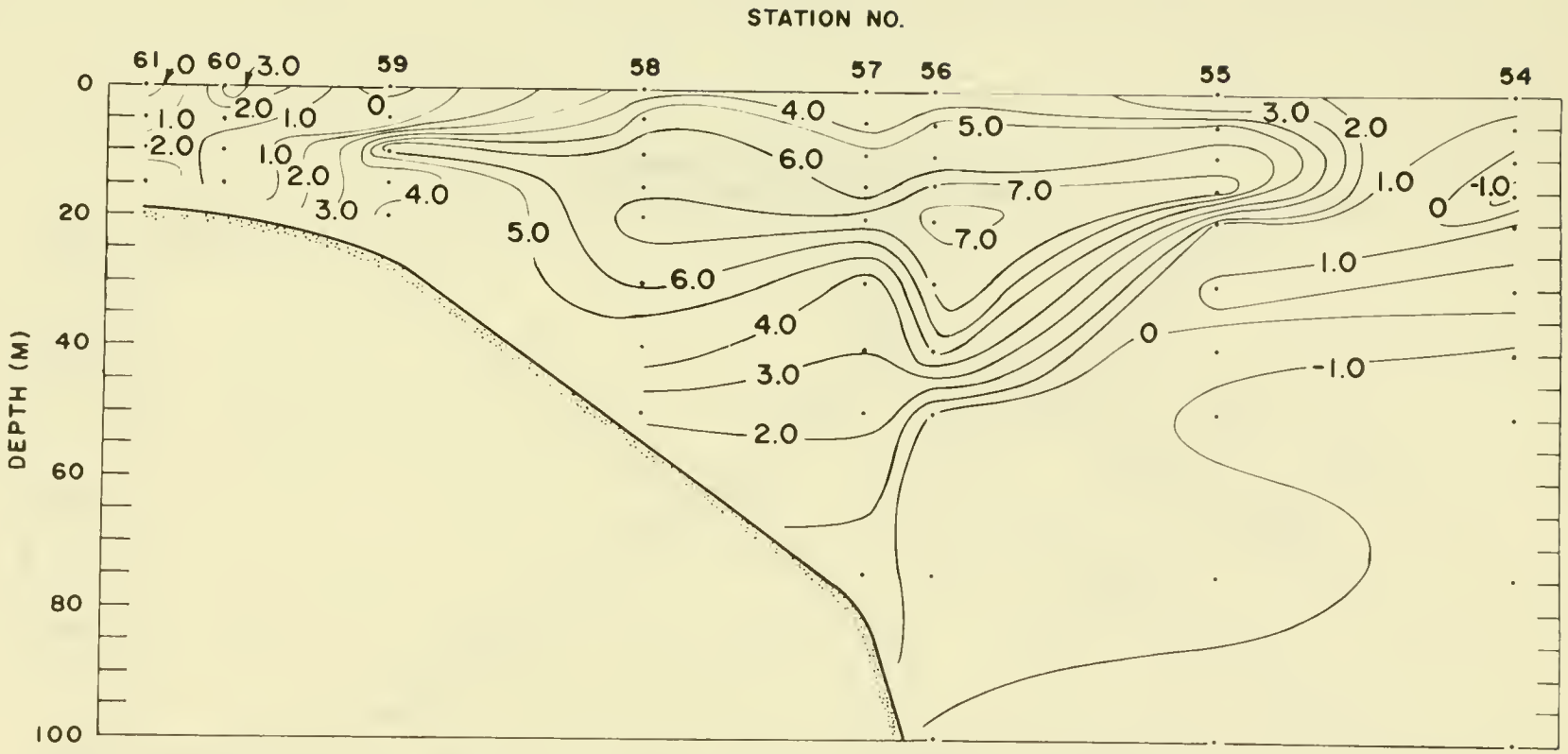

Figure 74.—Vertical profile of temperature (°C) to 100 meters along section B during WEBSEC-72, August-September, 1972

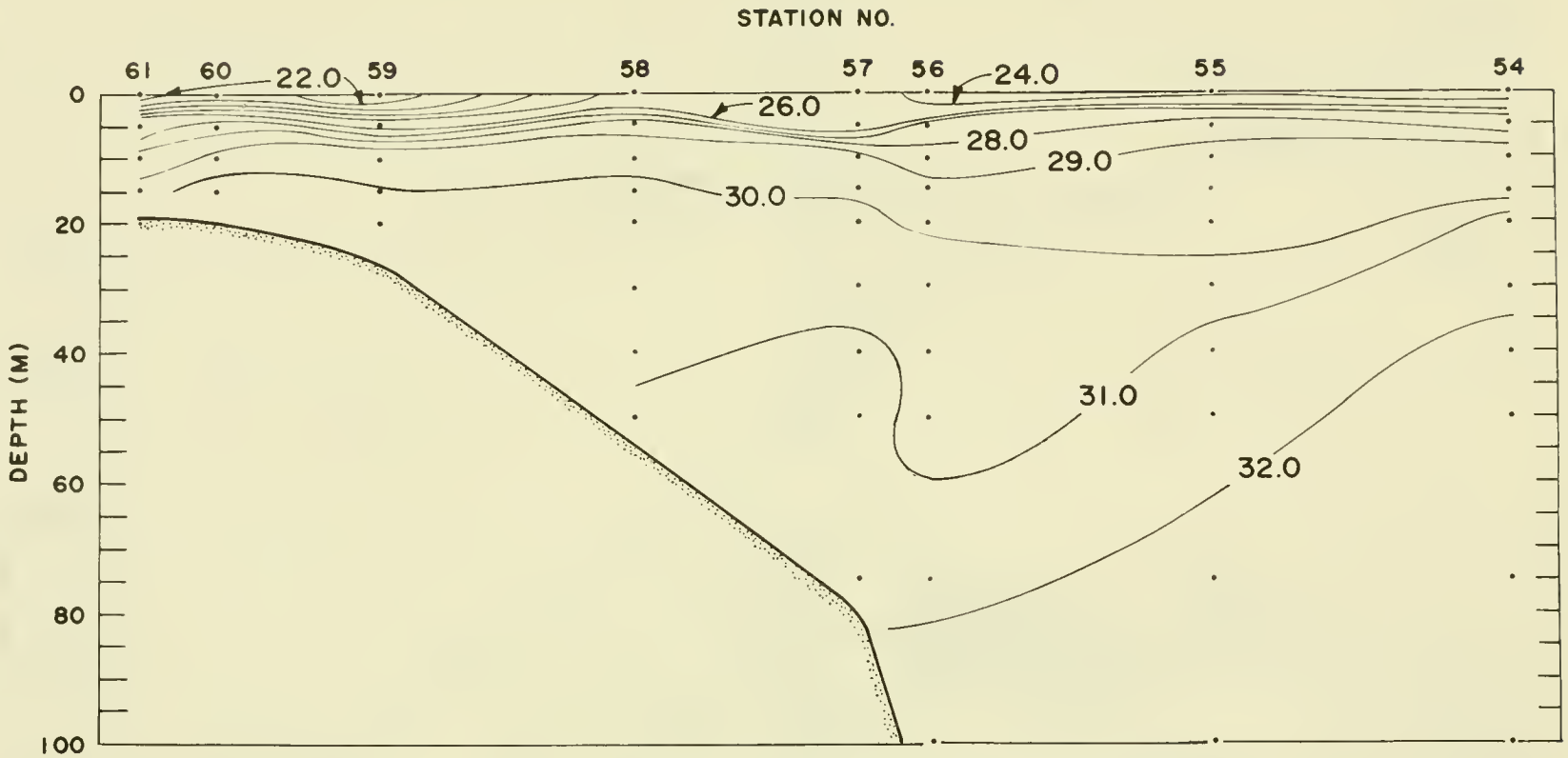

Figure 75.—Vertical profile of salinity (‰) to 100 meters along section B during WEBSEC-72, August-September, 1972.

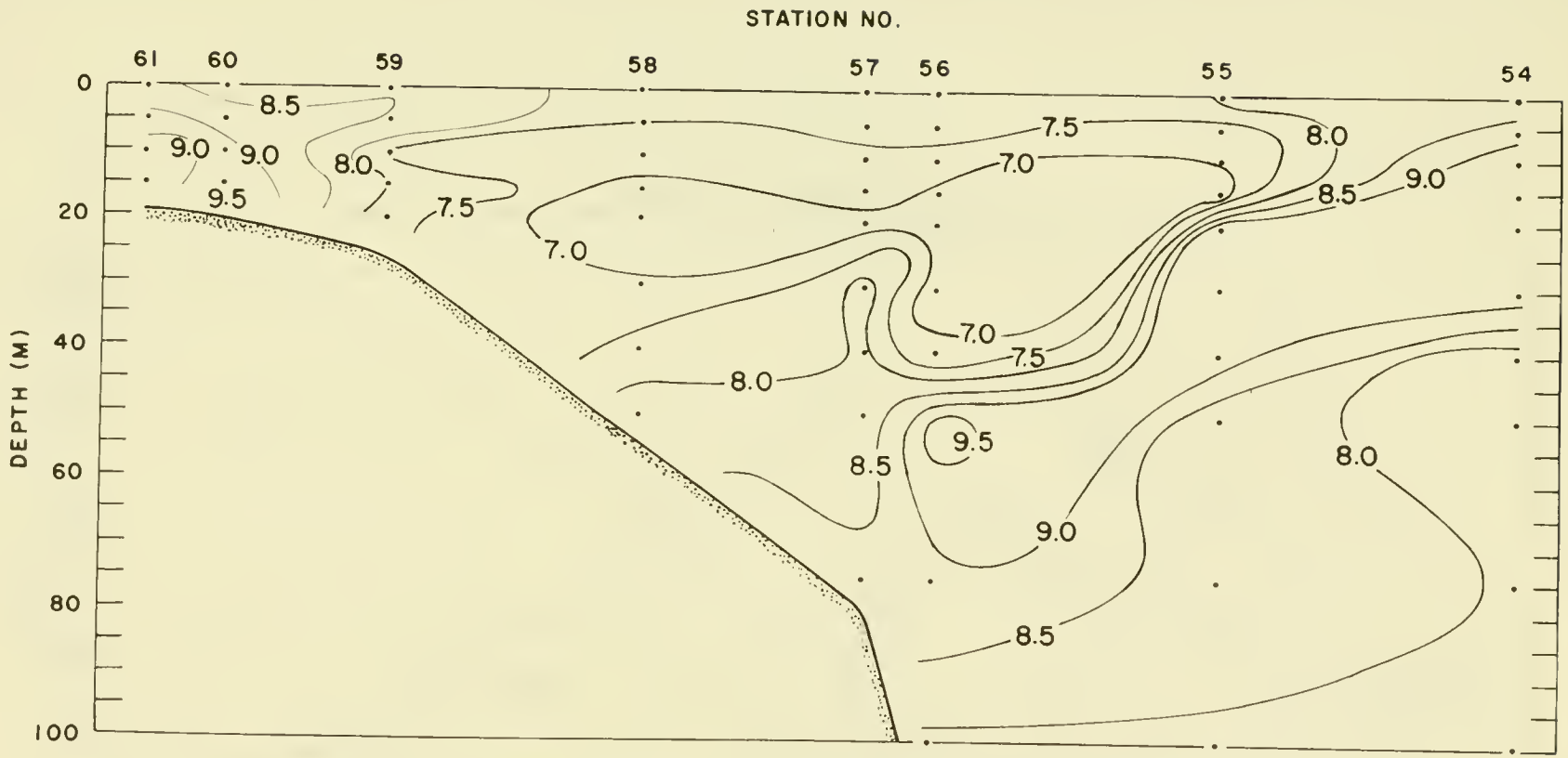

Figure 76.—Vertical profile of dissolved oxygen (ml/l) to 100 meters along section B during WEBSEC-72, August-September, 1972.

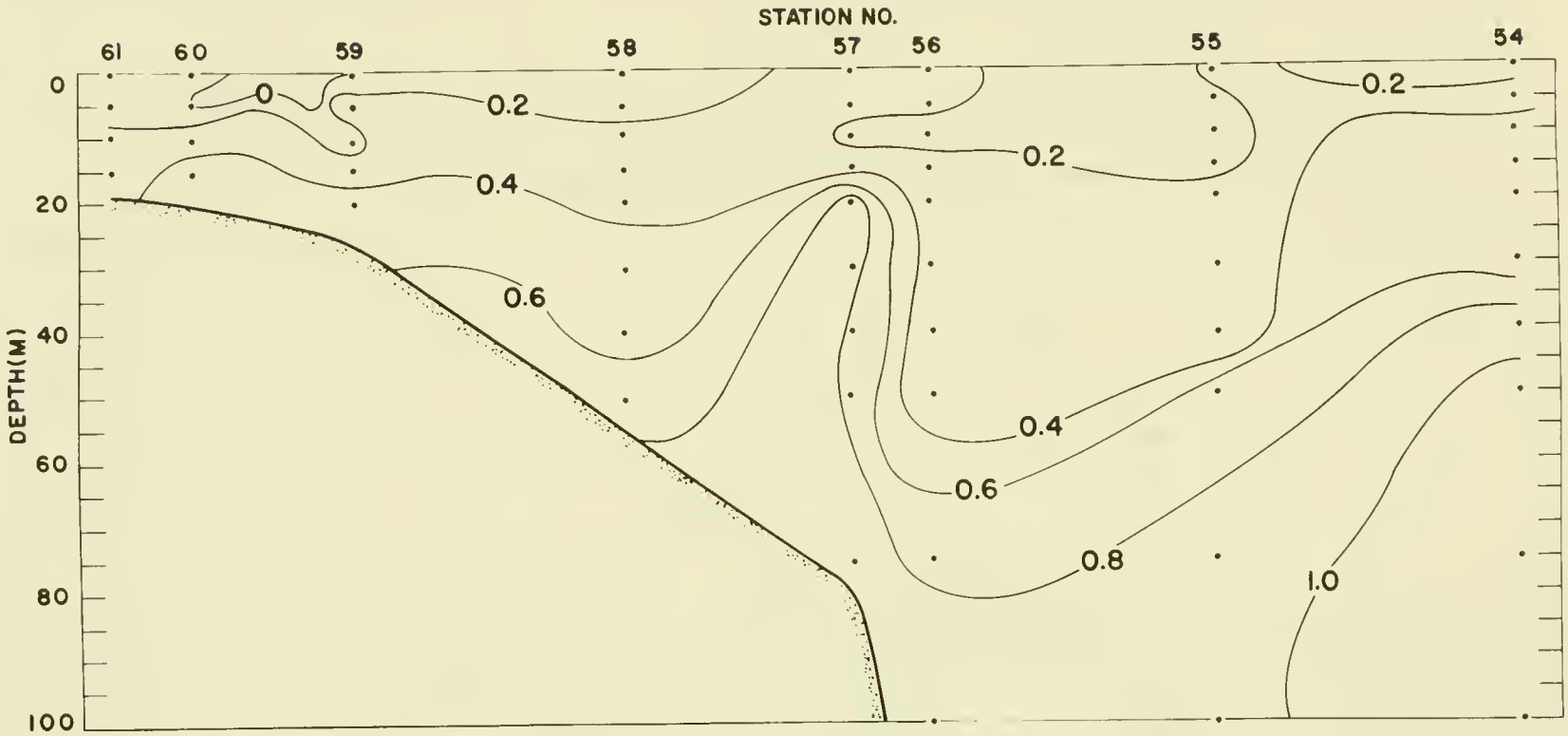

Figure 77.—Vertical profile of inorganic phosphate (μg-at/l) to 100 meters along section B during WEBSEC-72, August-September, 1972.

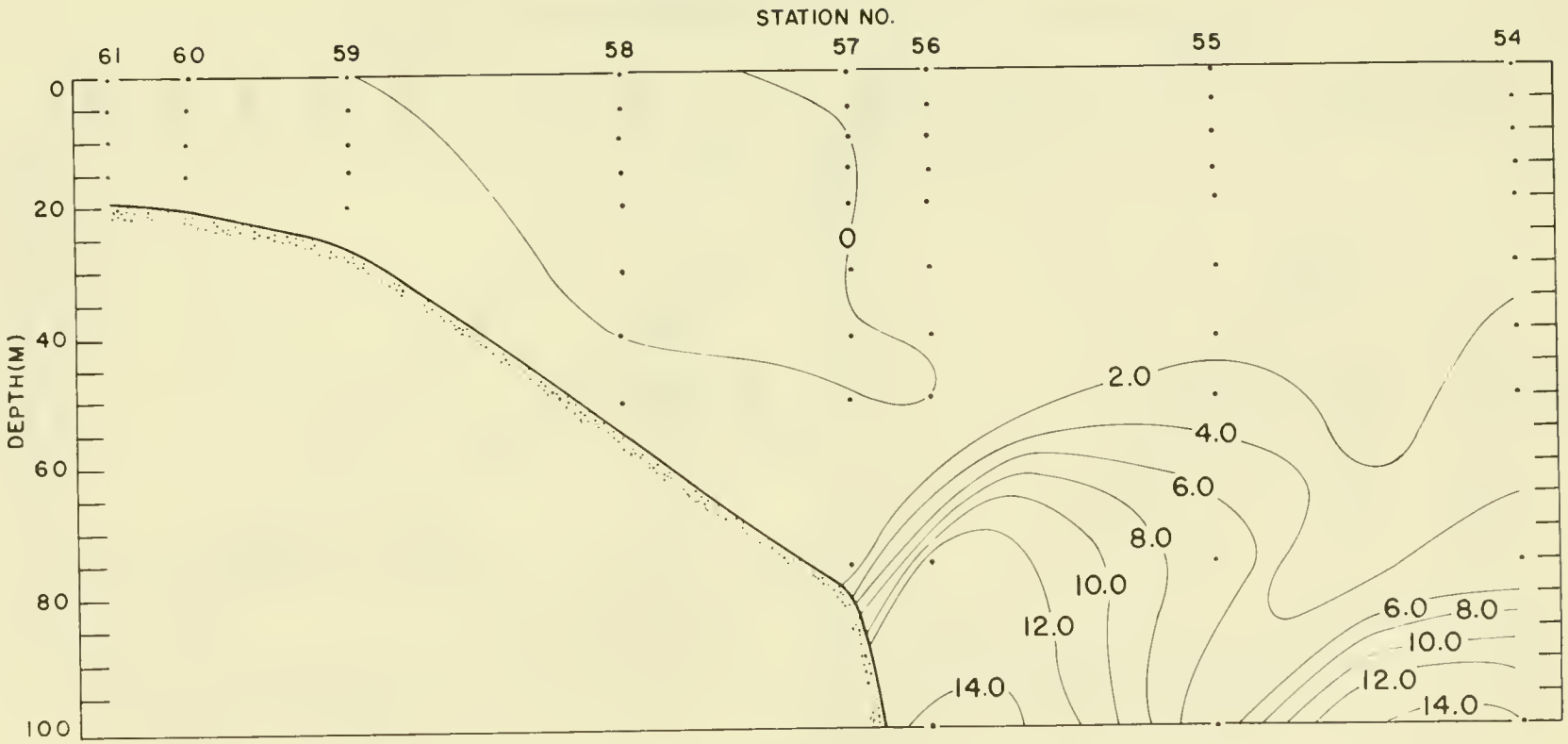

Figure 78.—Vertical profile of inorganic nitrate (μg-at/l) to 100 meters along section B during WEBSEC-72, August-September, 1972.

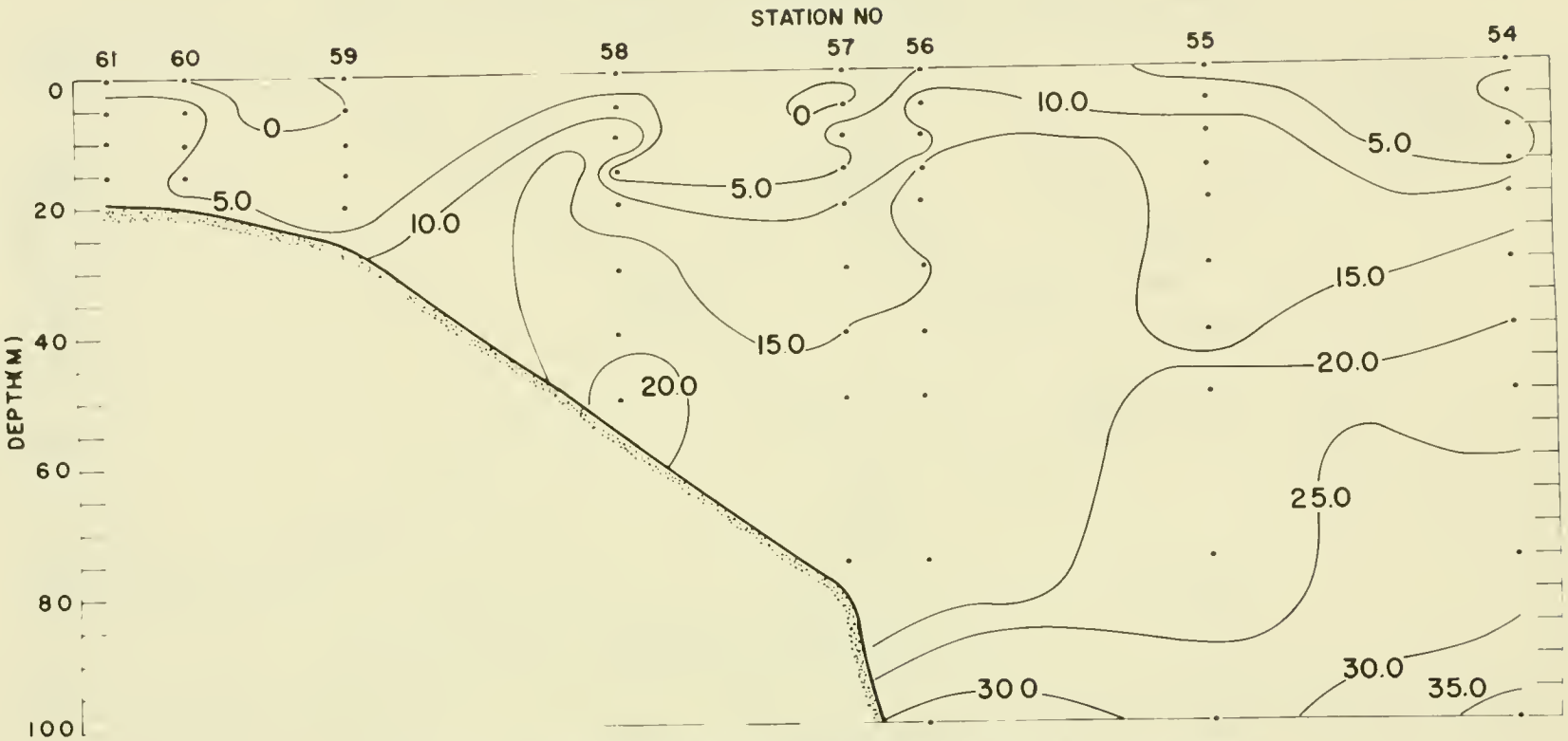

Figure 79. Vertical profile of inorganic silicate (μg-at/l) to 100 meters along section B during WEBSEC-72, August-September, 1972.

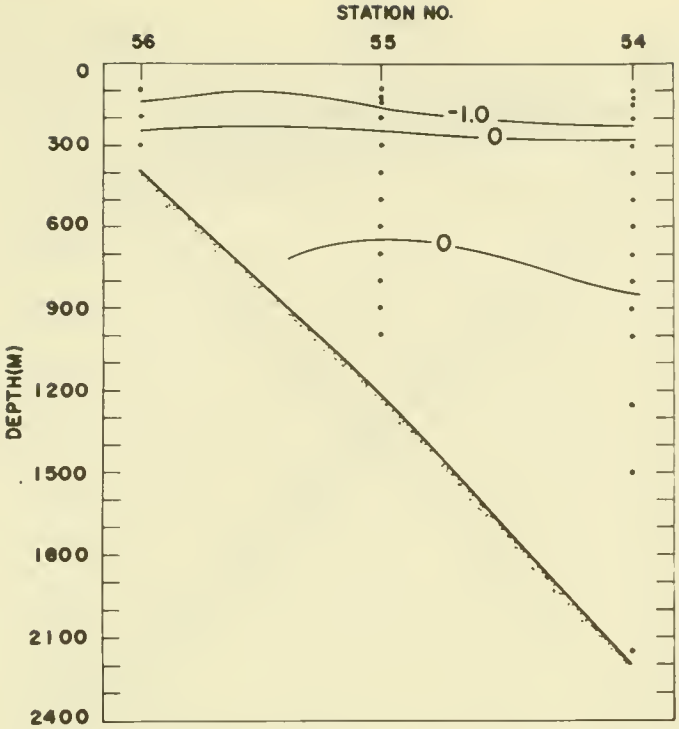

Figure 80.—Vertical profile of temperature (°C) from 100 meters to bottom along section A during WEBSEC-72, August-September, 1972.

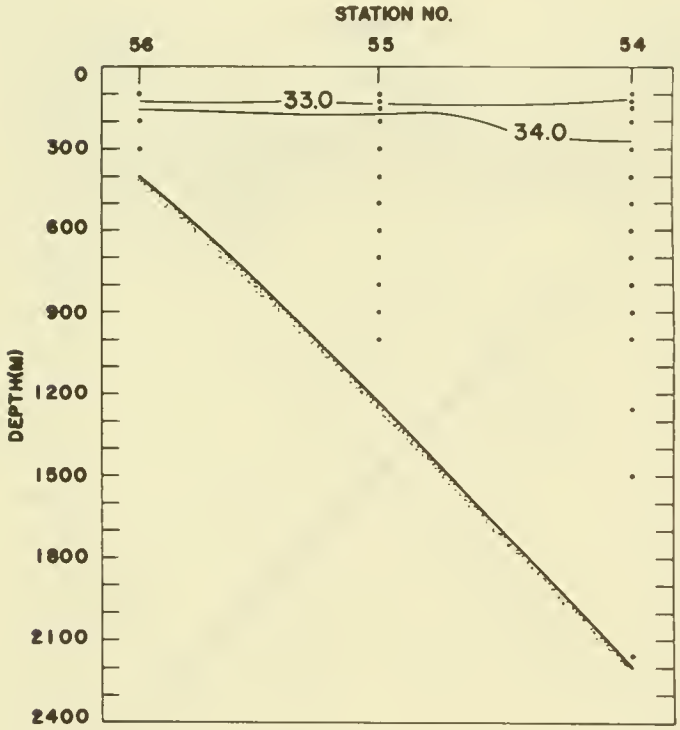

Figure 81.—Vertical profile of salinity (°/oo) from 100 meters to bottom along section B during WEBSEC-72, August-September, 1972.

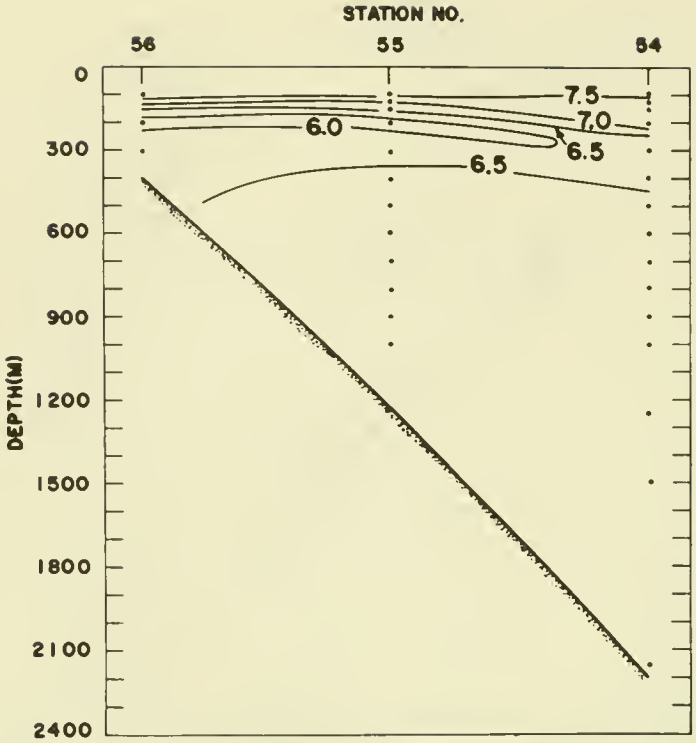

Figure 82.—Vertical profile of dissolved oxygen (ml/l) from 100 meters to bottom along section B during WEBSEC-72, August-September, 1972.

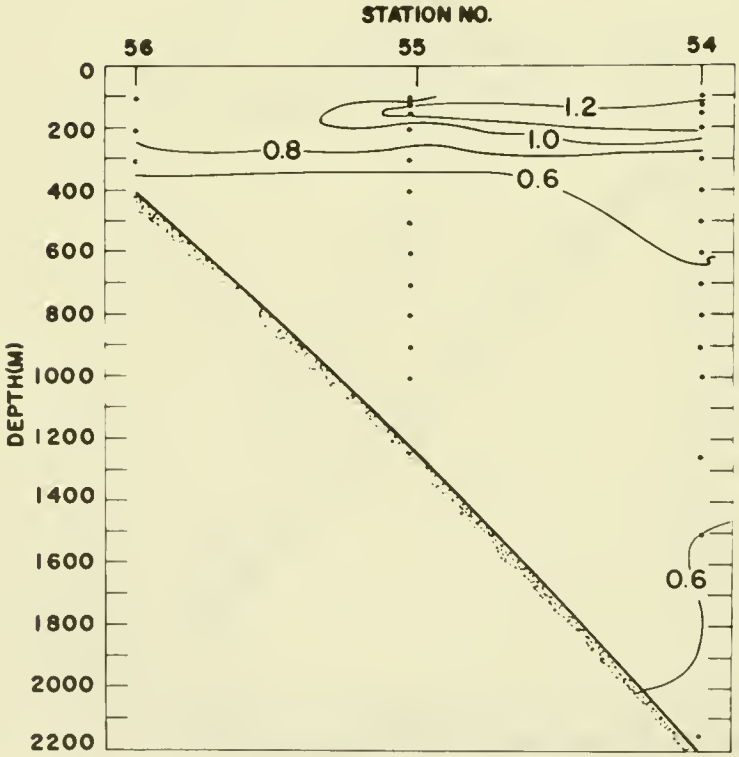

Figure 83.—Vertical profile of inorganic phosphate (μg-at/l) from 100 meters to bottom along section B during WEBSEC-72, August-September, 1972.

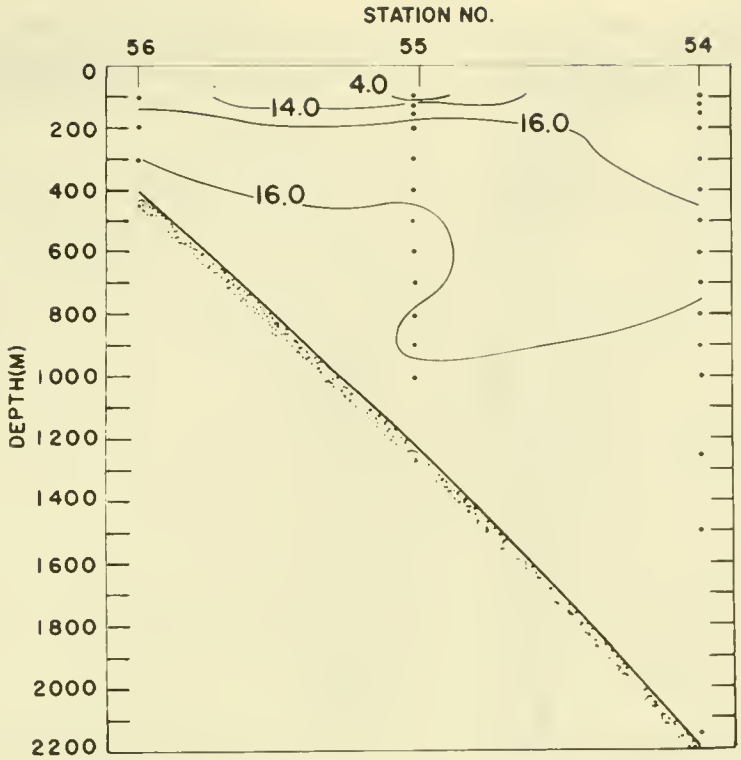

Figure 84.—Vertical profile of inorganic nitrate (μg-at/l) from 100 meters to bottom along section B during WEBSEC-72, August-September, 1972.

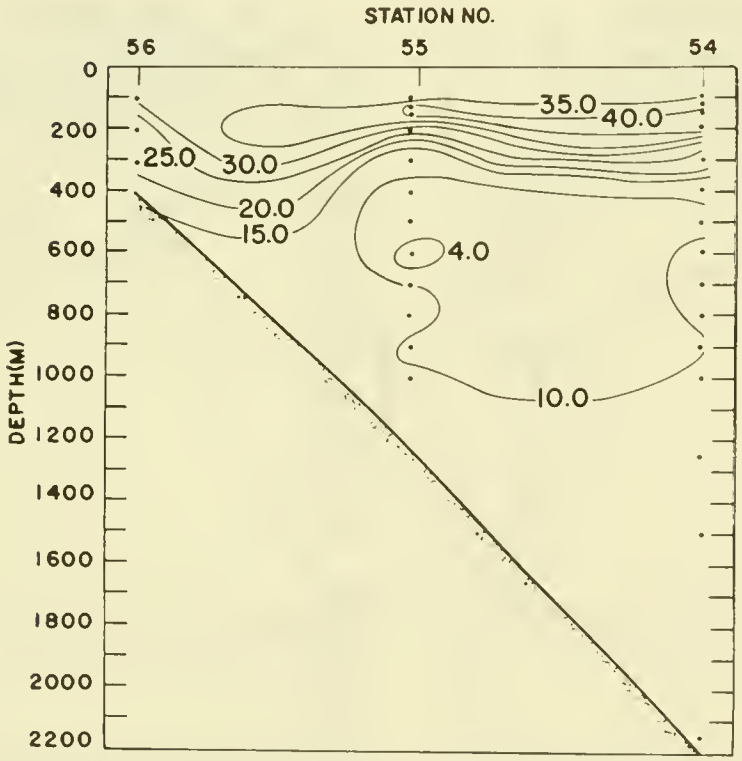

Figure 85.—Vertical profile of inorganic silicate (μg-at/l) from 100 meters to bottom along section B during WEBSEC-72, August-September, 1972.

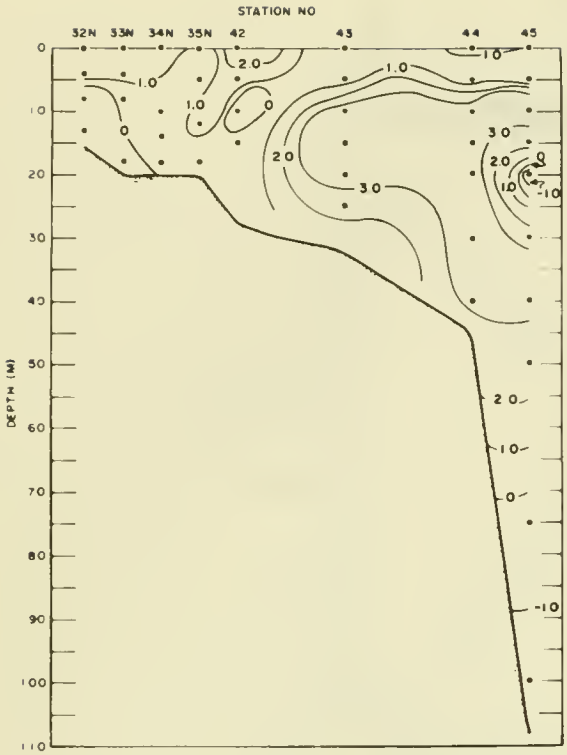

Figure 86.—Vertical profile of temperature (°C) along section C during WEBSEC-72, August-September, 1972.

Figure 87.—Vertical profile of salinity (°/oo) along section C during WEBSEC-72, August-September, 1972.

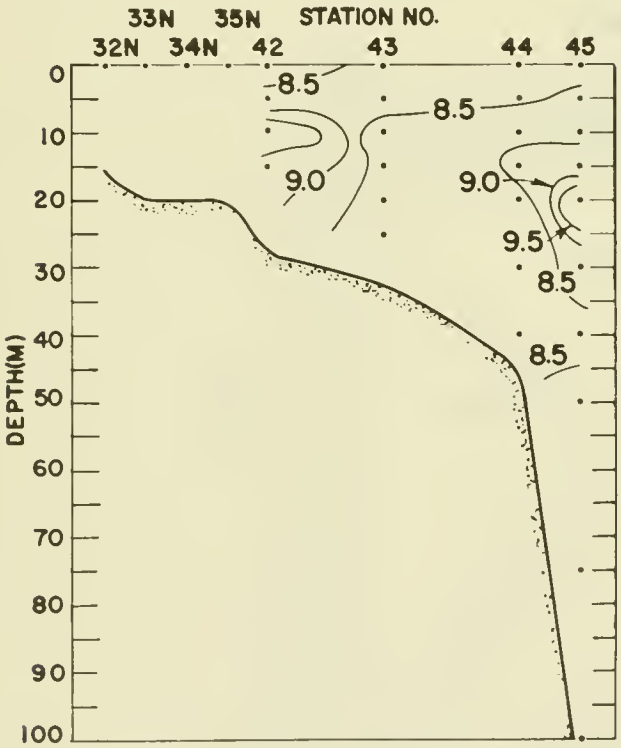

Figure 88.—Vertical profile of dissolved oxygen (ml/l) along section C WEBSEC-72, August-September, 1972.

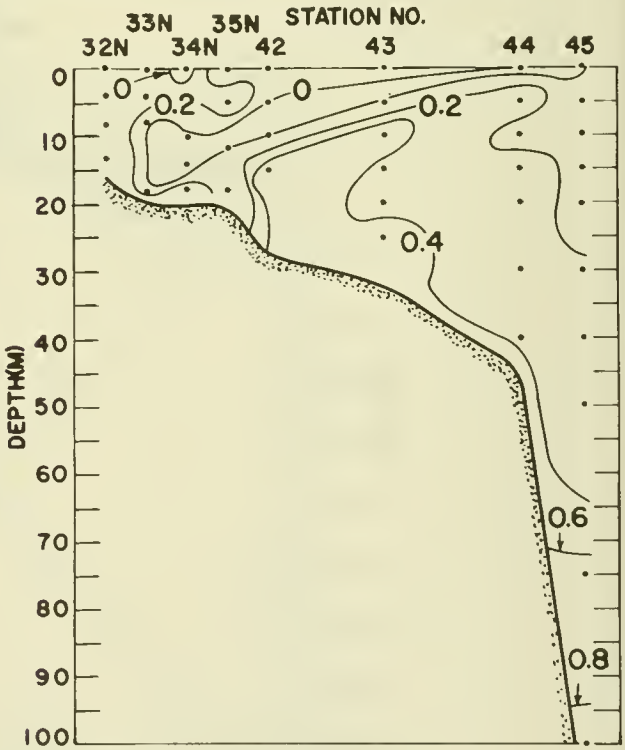

Figure 89.—Vertical profile of inorganic phosphate (μg-at/l) along section C during WEBSEC-72, August-September, 1972.

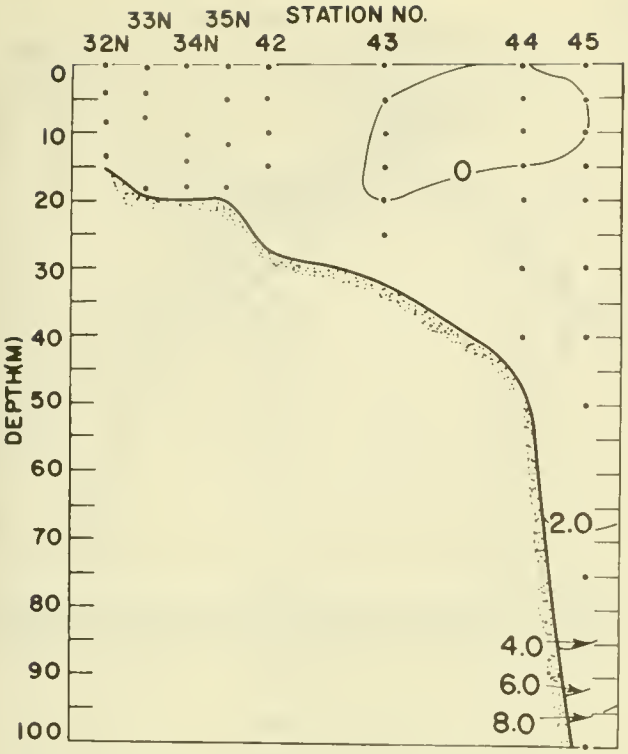

Figure 90.—Vertical profile of inorganic nitrate (μg-at/l) along section C during WEBSEC-72, August-September, 1972.

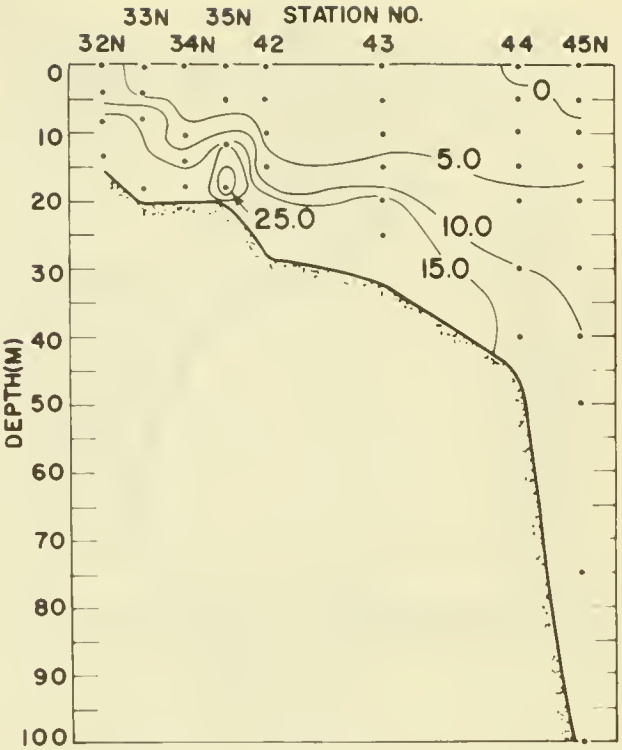

Figure 91.—Vertical profile of inorganic silicate (μg-at/l) along section C during WEBSEC-72, August-September 1972.

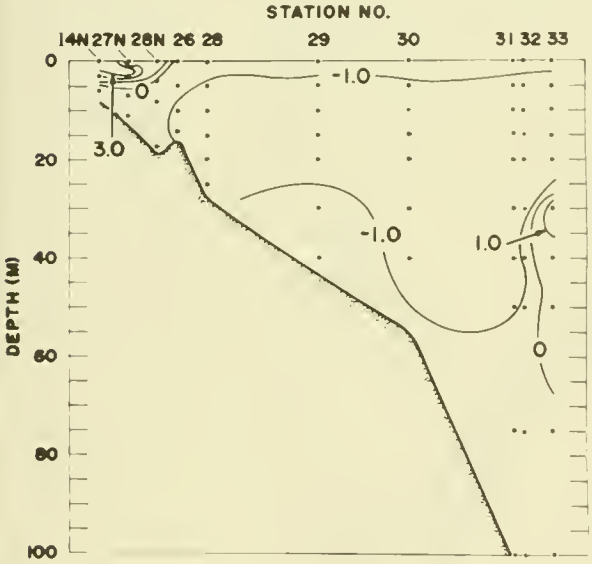

Figure 92.—Vertical profile of temperature (°C) along section D during WEBSEC-72, August-September, 1972.

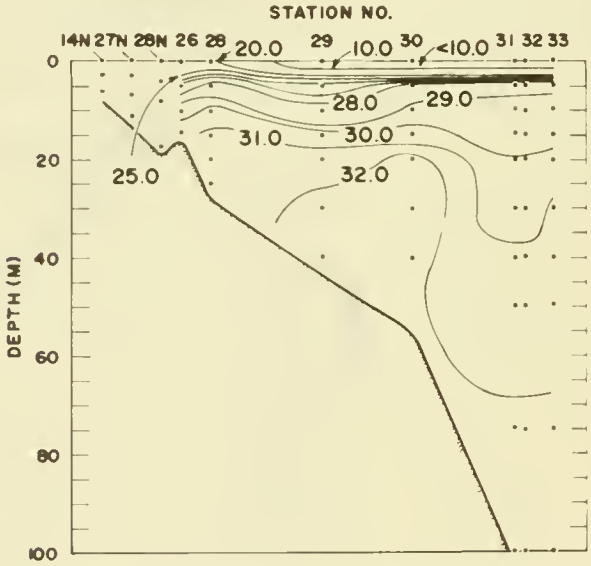

Figure 93.—Vertical profile of salinity (°/oo) along section D during WEBSEC-72, August-September, 1972.

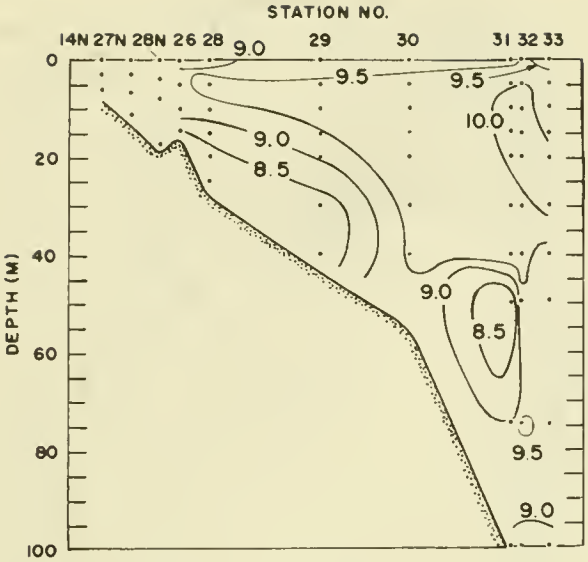

Figure 94.—Vertical profile of dissolved oxygen (ml/l) along section D during WEBSEC-72, August-September, 1972.

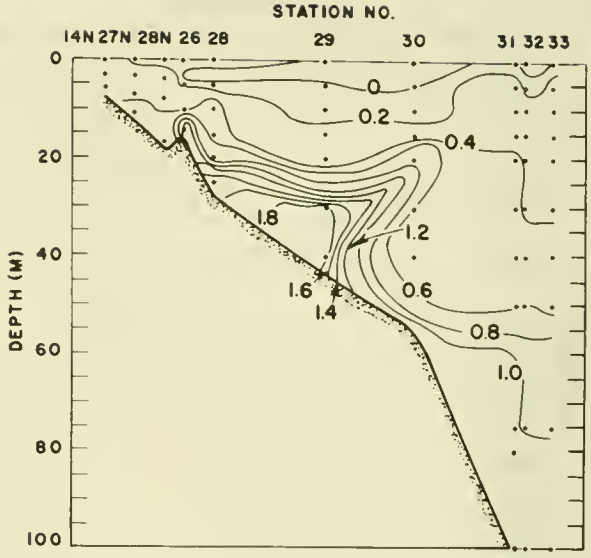

Figure 95.—Vertical profile of inorganic phosphate (μg-at/l) along section D during WEBSEC-72, August-September, 1972.

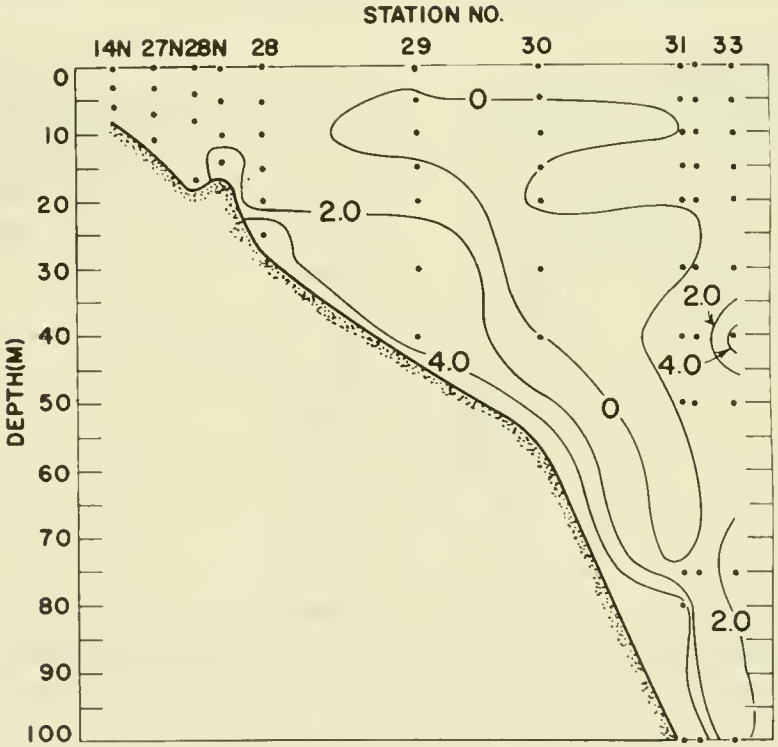

Figure 96.—Vertical profile of inorganic nitrate (μg-at/l) along section D during WEBSEC-72, August-September, 1972.

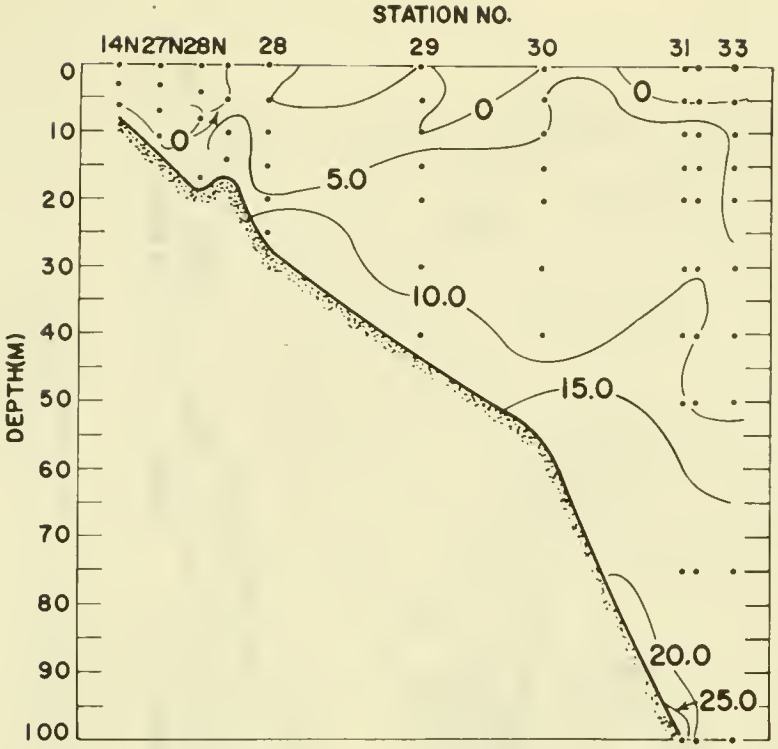

Figure 97.—Vertical profile of inorganic silicate (μg-at/l) along section D during WEBSEC-72, August-September, 1972.

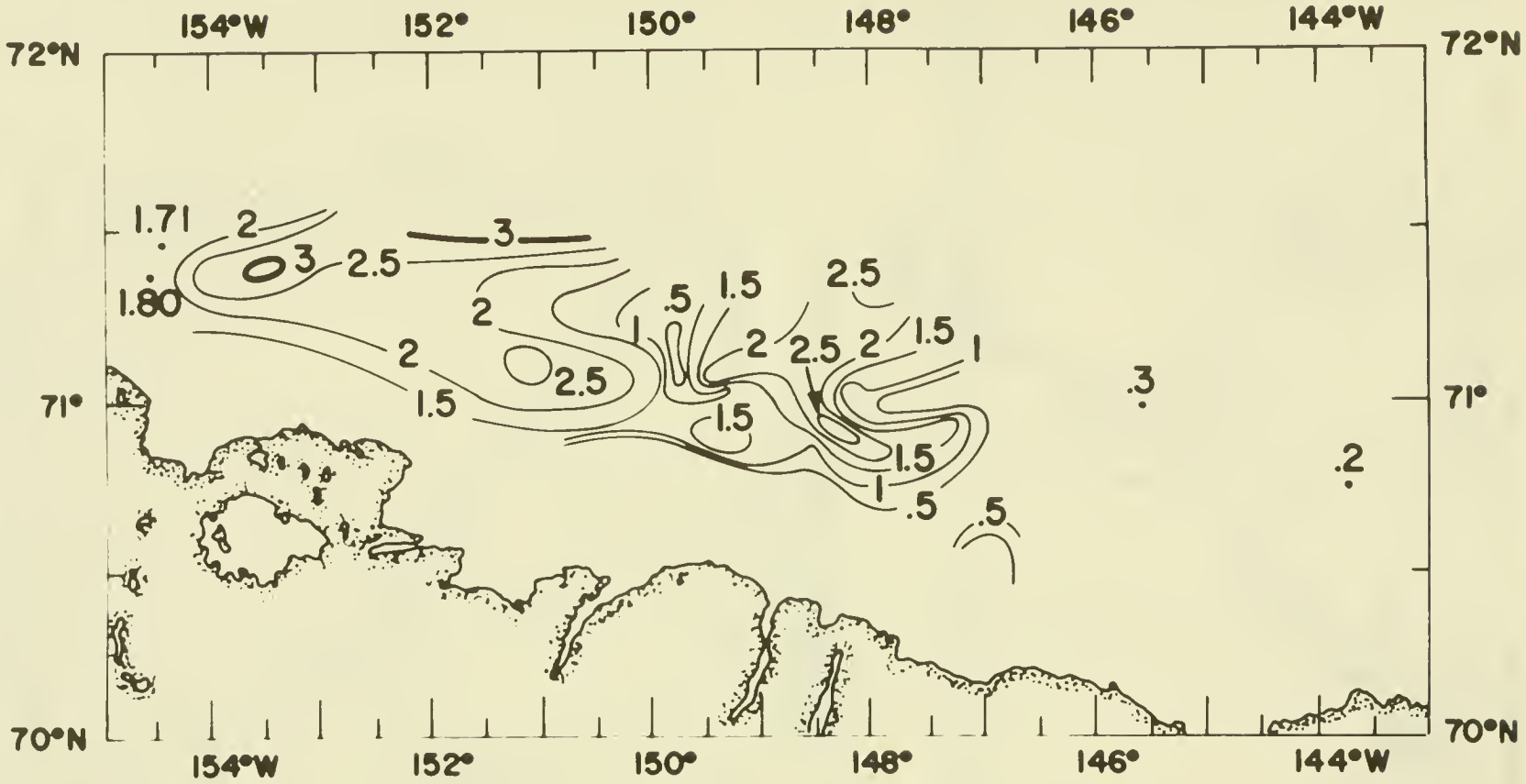

Figure 98.—Horizontal distribution of core temperature (°C) of the warm layer regardless of depth during WEBSEC-71, August-September, 1971.

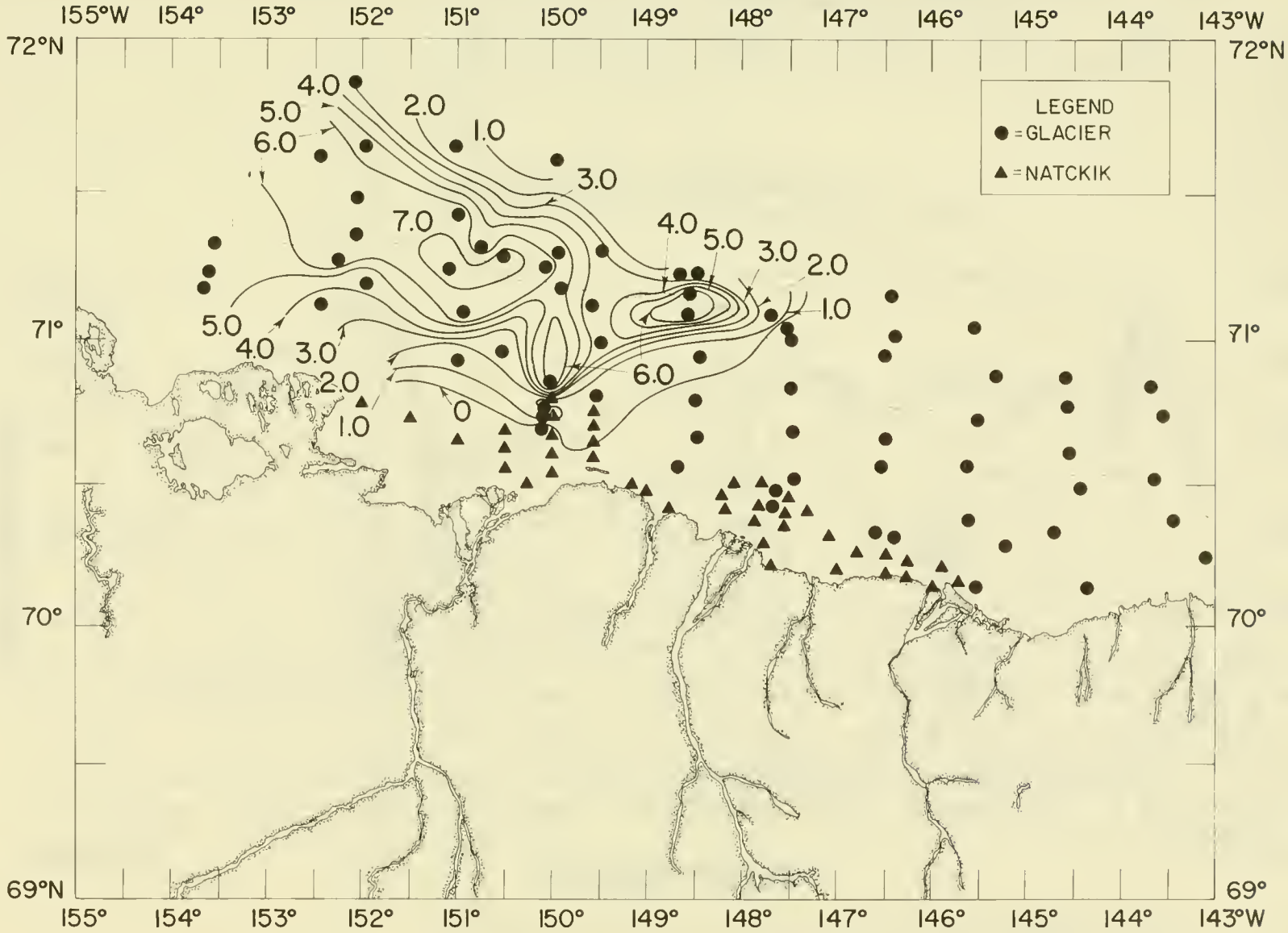

Figure 99.—Horizontal distribution of core temperature (°C) of the warm layer regardless of depth during WEBSEC-72, August-September, 1972.

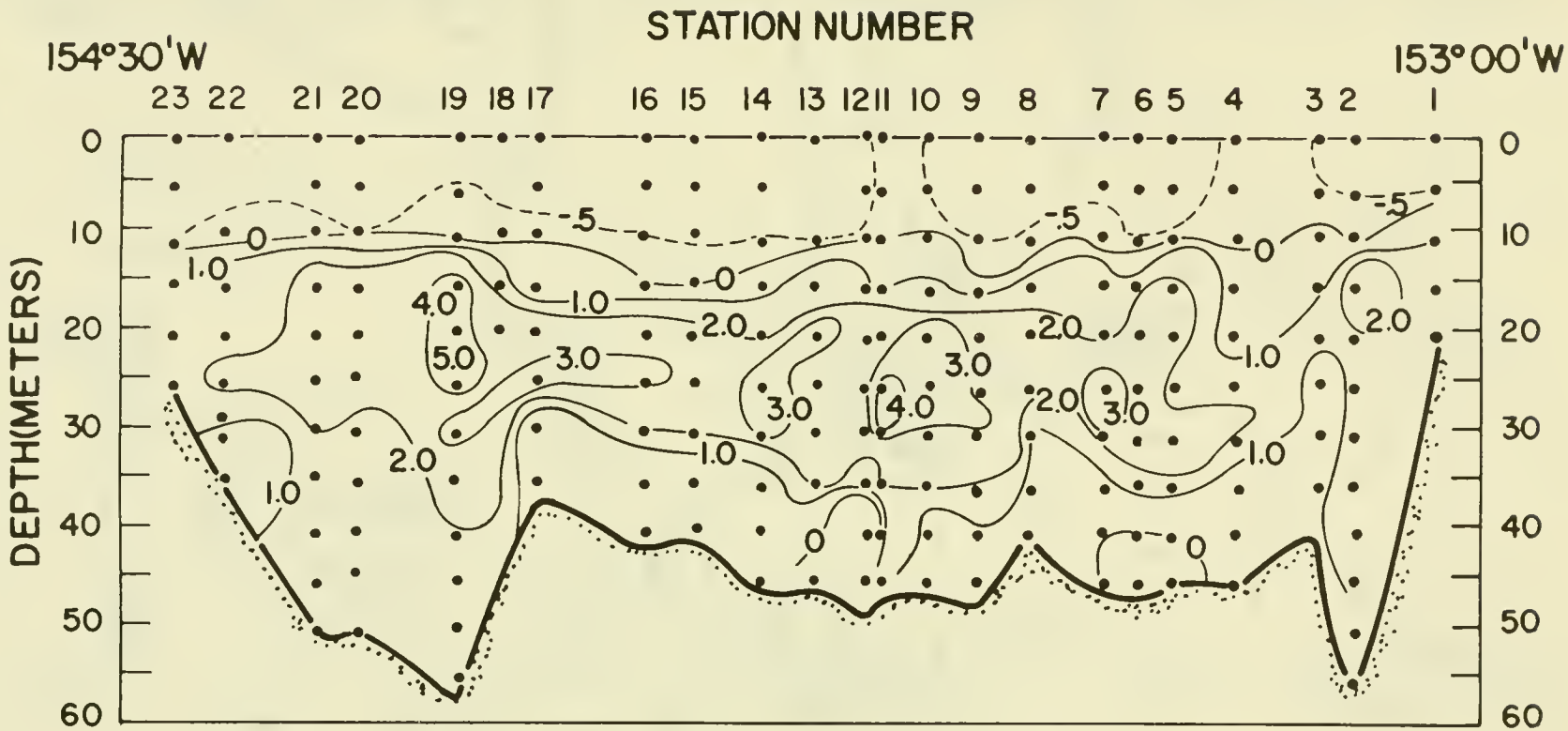

Figure 100.—Vertical profile of temperature (°C) along an XBT section (shown in figure 2) taken during WEBSEC-71, August-September, 1971.

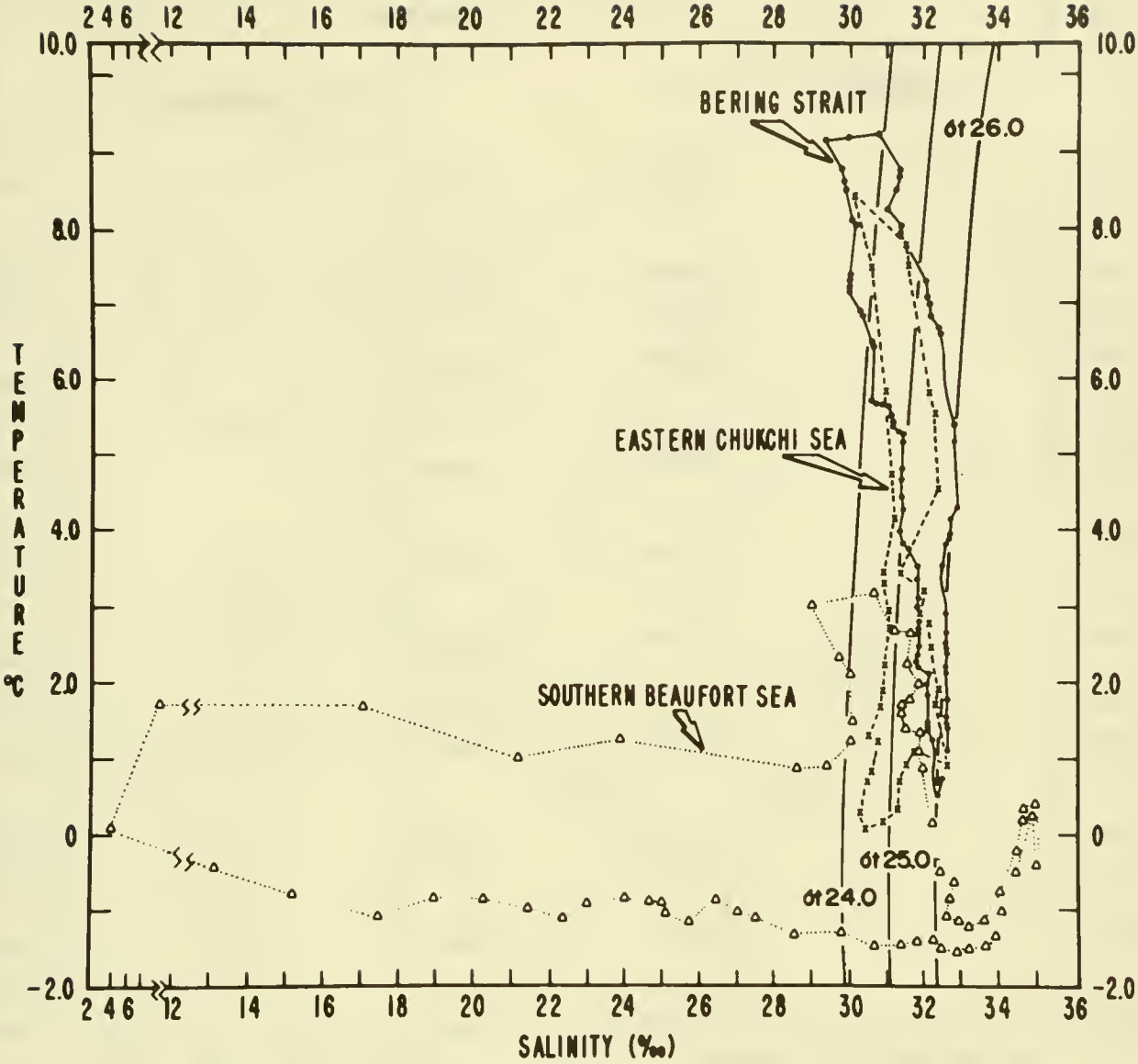

Figure 101.—Temperature (°C)-salinity (‰) values from Beaufort Sea (WEBSEC-71, August-September 1971), Bering Strait (Northwind, August 1968, July-August 1969) and Chukchi Sea (Glacier, September-October, 1970).

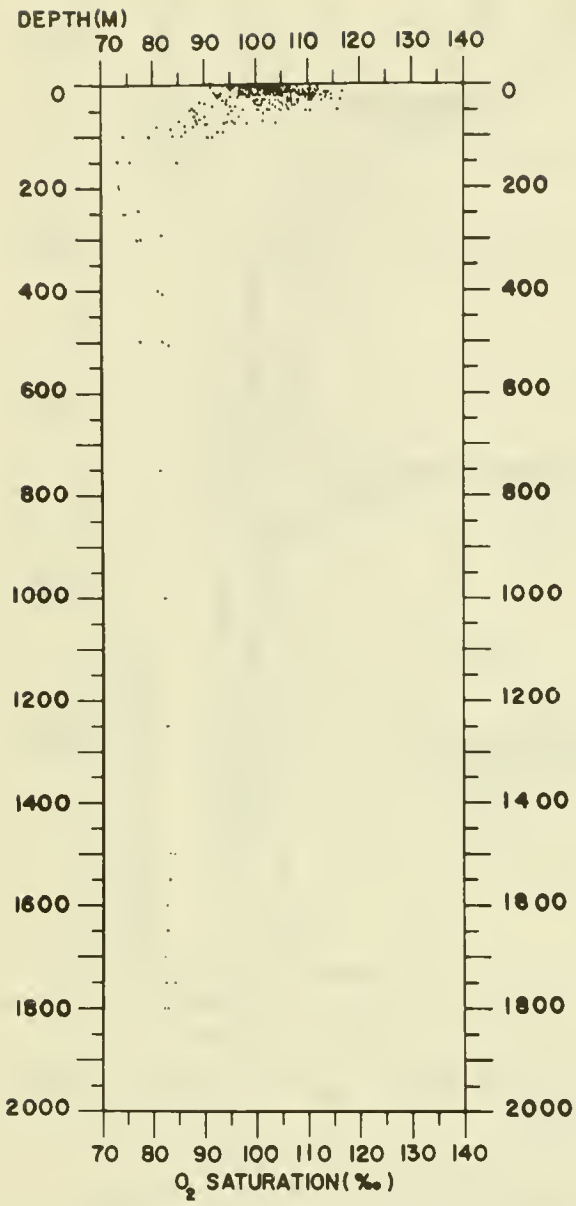

Figure 102.—Per cent saturation of dissolved oxygen versus depth for all stations taken during WEBSEC-71.

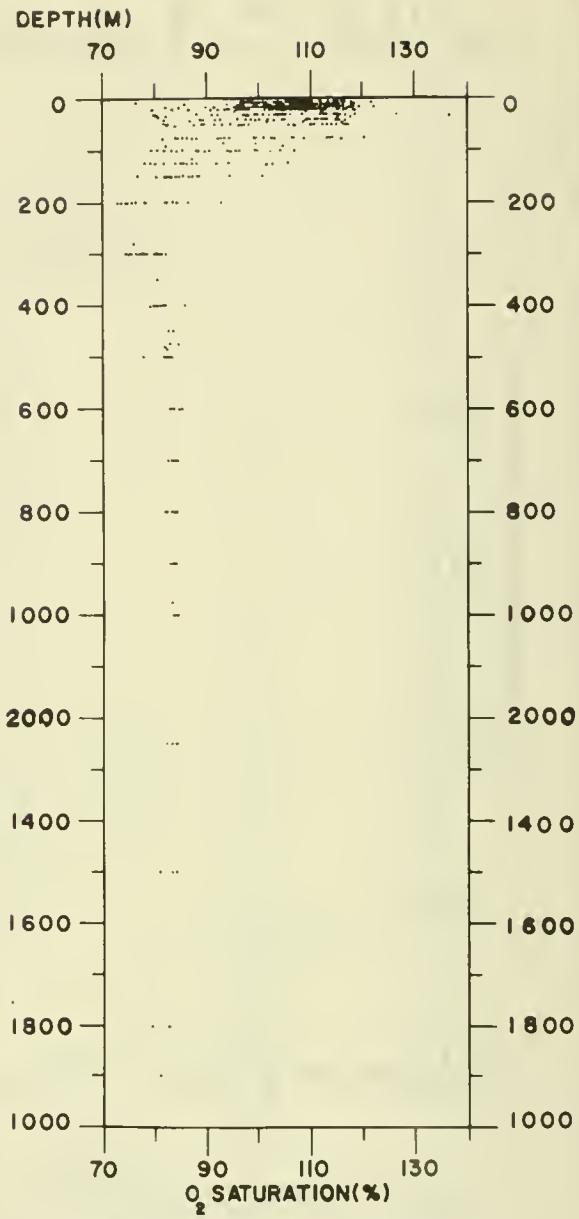

Figure 103.—Per cent saturation of dissolved oxygen versus depth for all stations taken during WEBSEC-72.

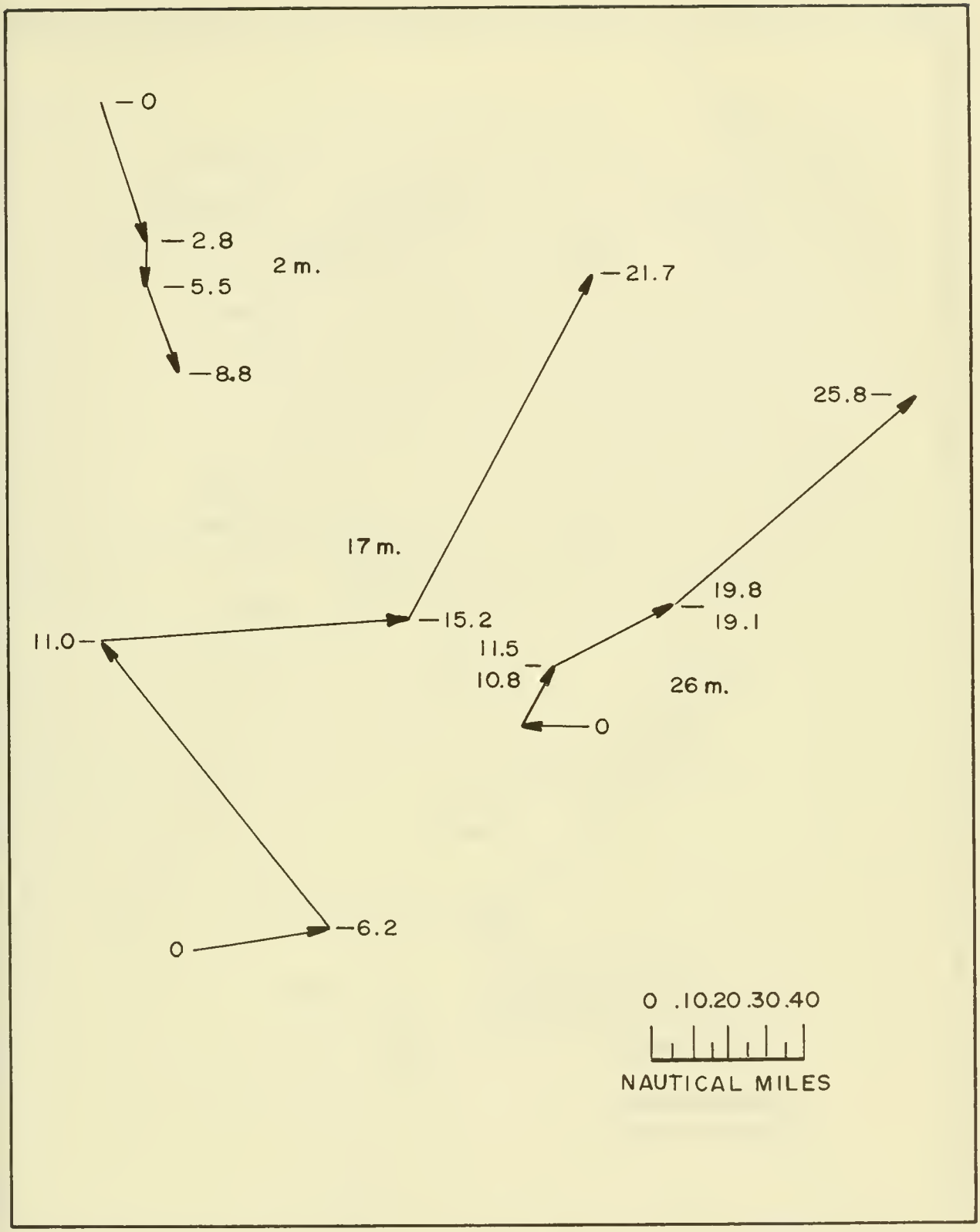

Figure 104.—Progressive vector diagram of currents at station 23 (WEBSEC-71) during period of 8.8 hours at 2 meters, 21.7 hours at 17 meters, and 25.8 hours at 26 meters depth.

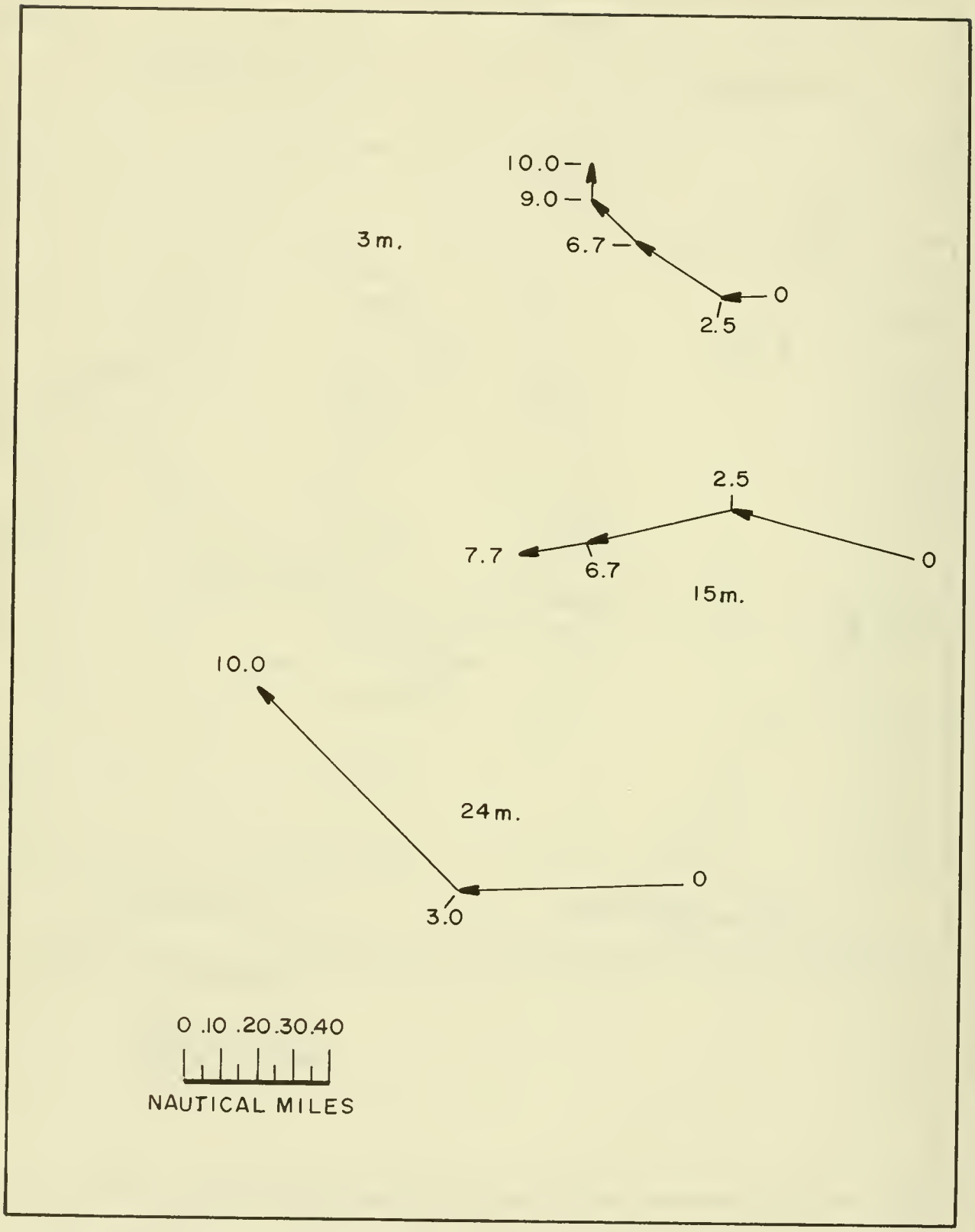

Figure 105.—Progressive vector diagram of currents at station 67 (WEBSEC-71), during period of 10.0 hours at 3 meters, 7.7 hours at 15 meters and 10.0 hours at 24 meters.

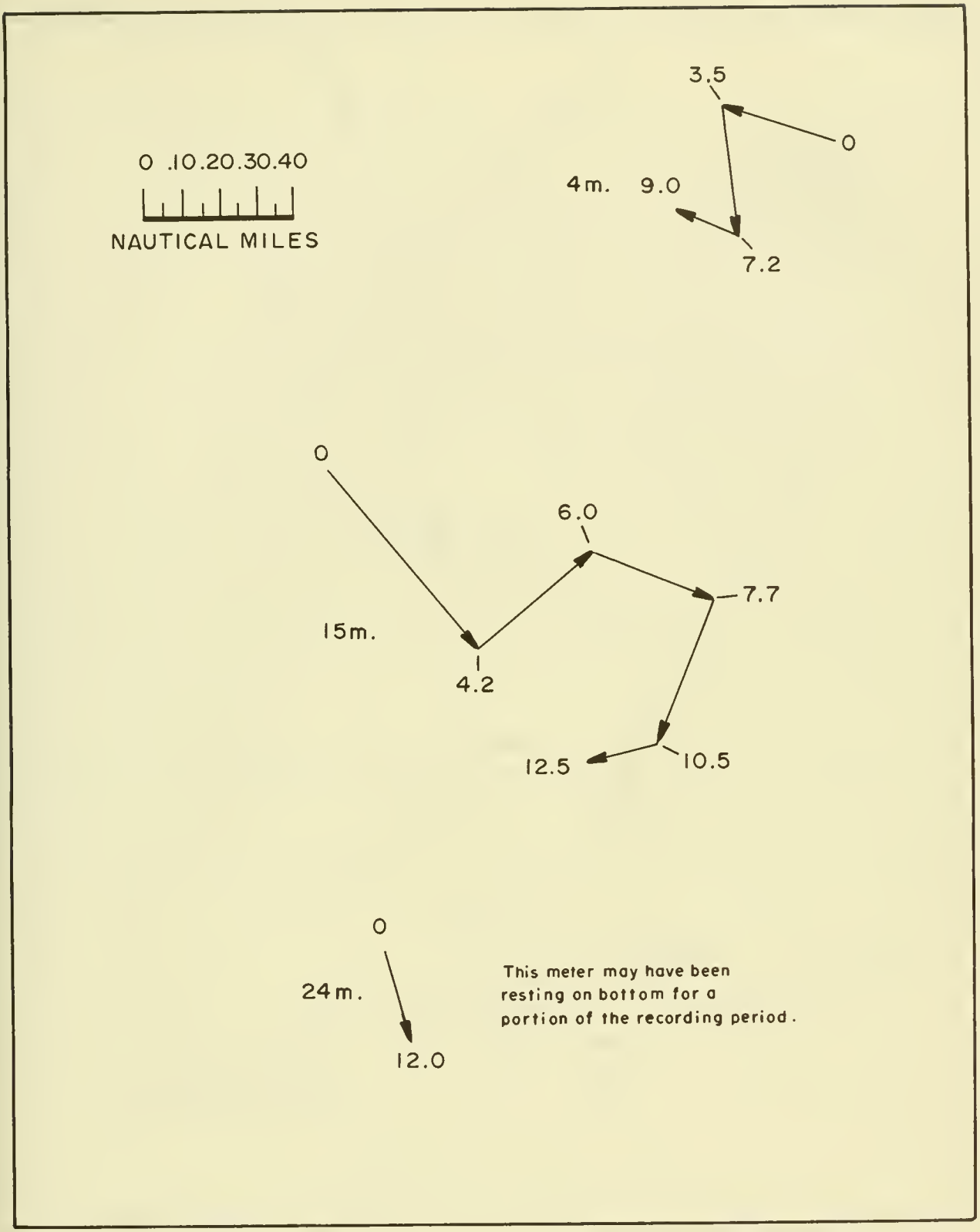

Figure 106.—Progressive vector diagram of currents at station 69 (WEBSEC-71) during period of 9.0 hours at 4 meters, 12.5 hours at 15 meters and 12.0 hours at 24 meters.

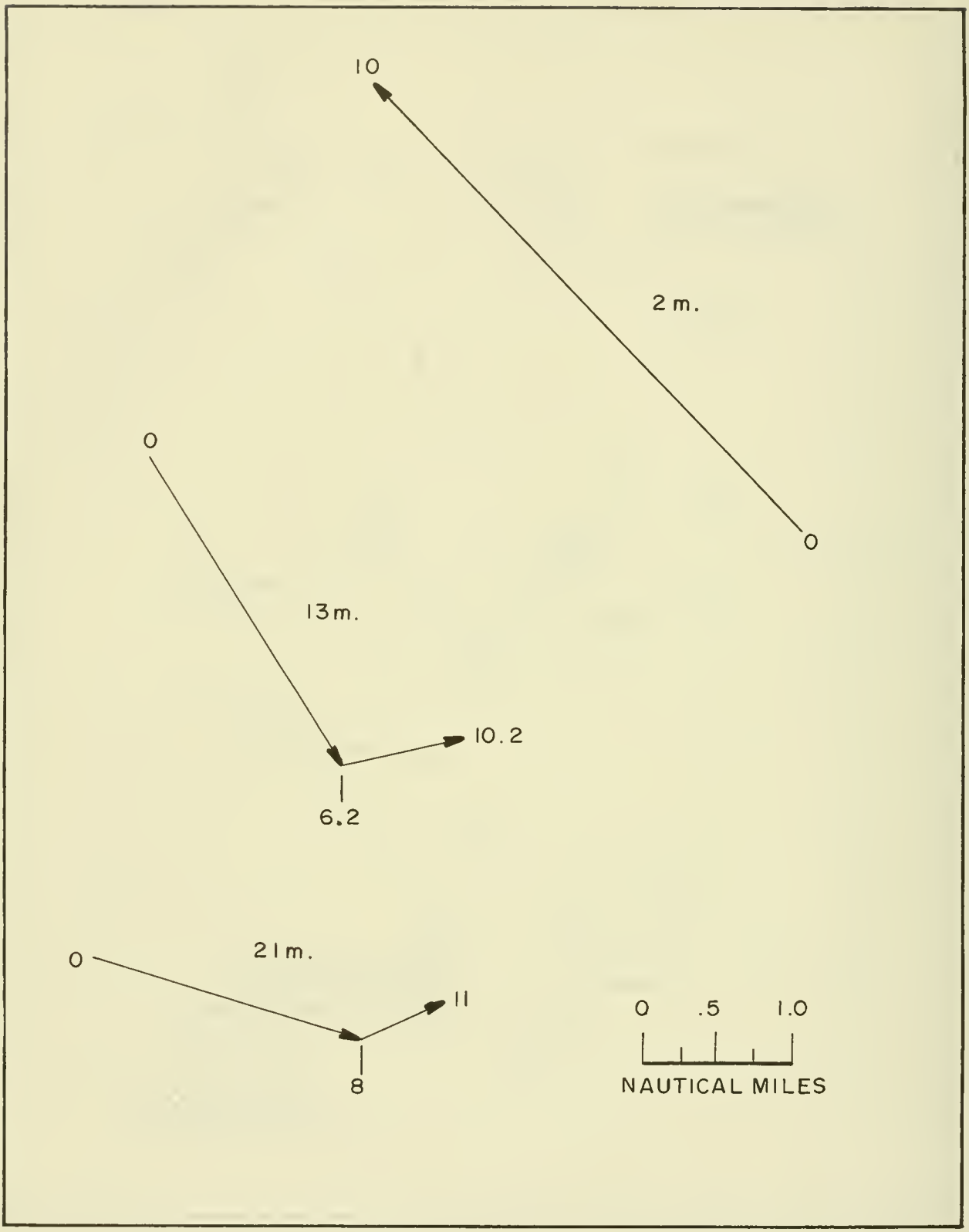

Figure 107.—Progressive vector diagram of currents at station 90 (WEBSEC-71) during period of 10.0 hours at 2 meters, 10.2 hours at 13 meters and 11 hours at 21 meters.

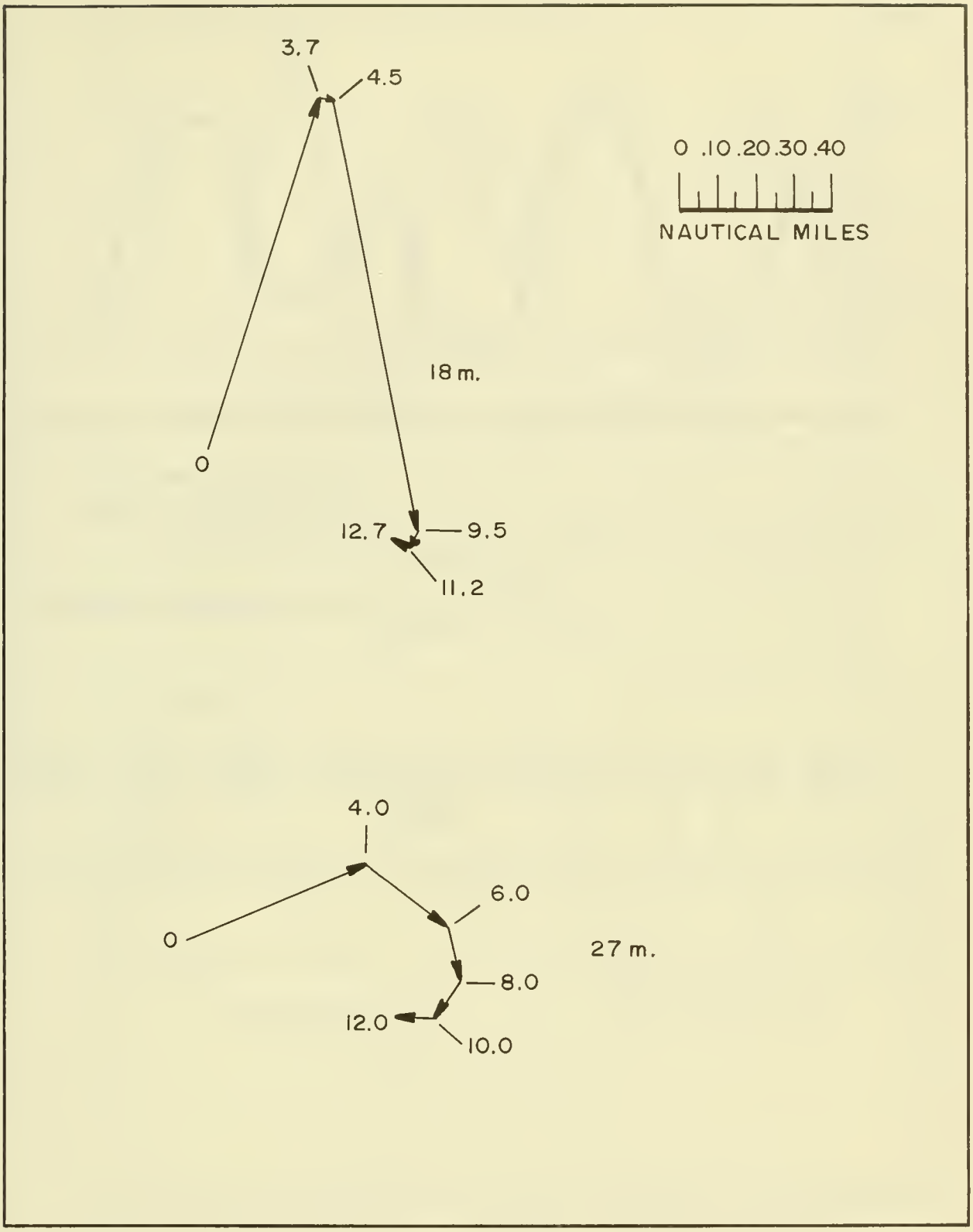

Figure 108.—Progressive vector diagram of currents at station 94 (WEBSEC-71) during period of 12.2 hours at 13 meters and 12.0 hours at 27 meters.

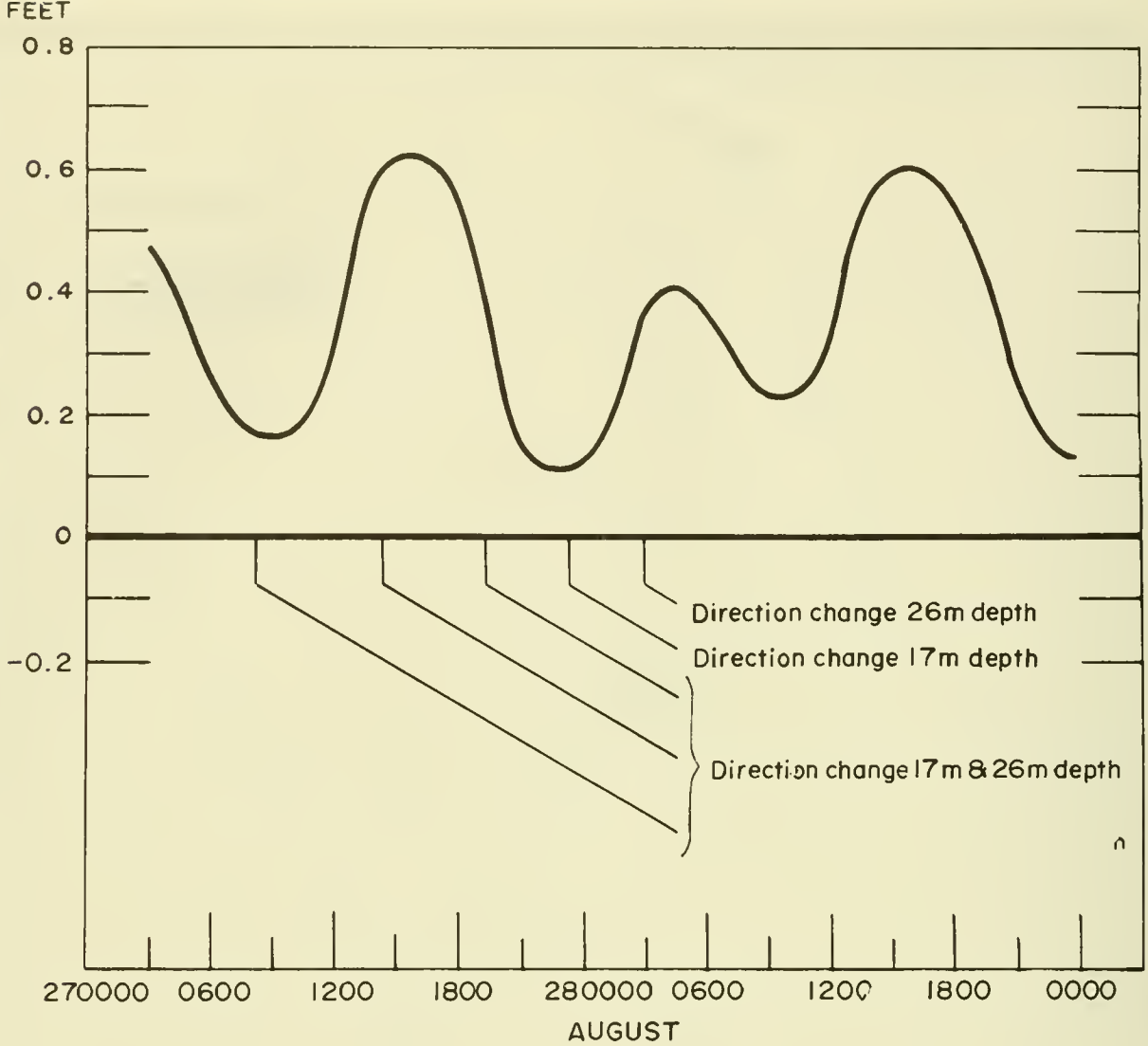

Figure 109.—Predicted tide curves for station 23 taken from data from Flaxman Island, Alaska (U. S. Dept. of Commerce, 1970).

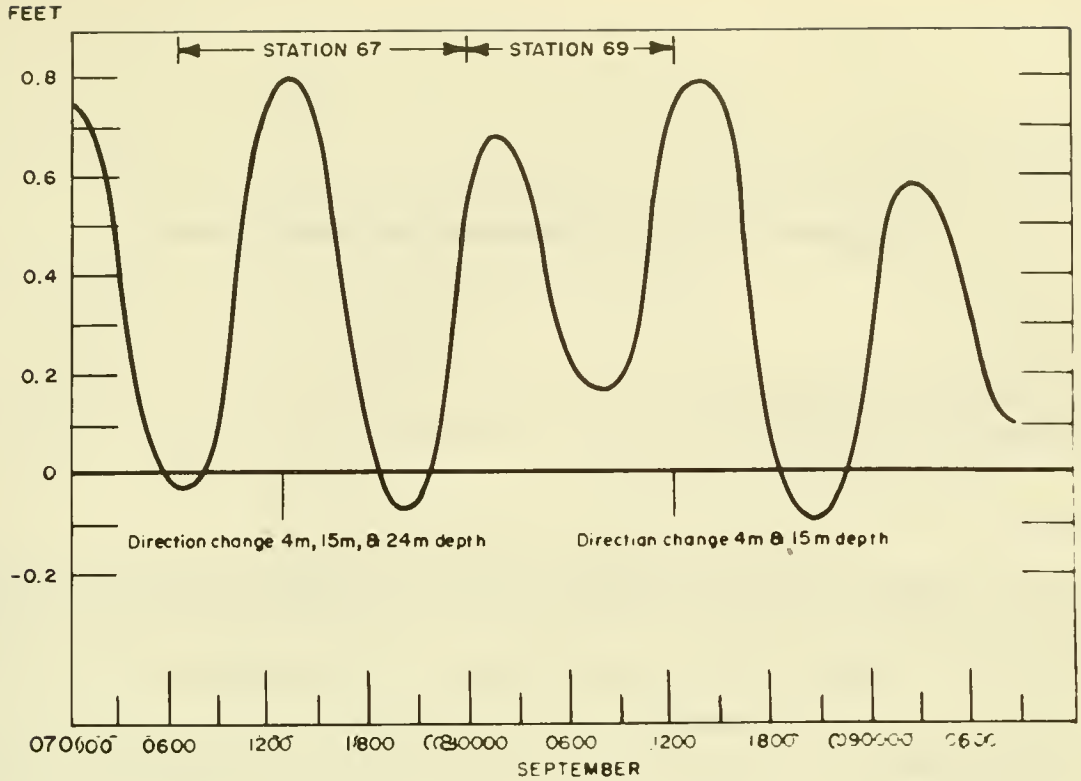

Figure 110.—Predicted tides curves for stations 67 and 69 taken from data from Flaxman Island, Alaska (U. S. Dept. of Commerce, 1970).

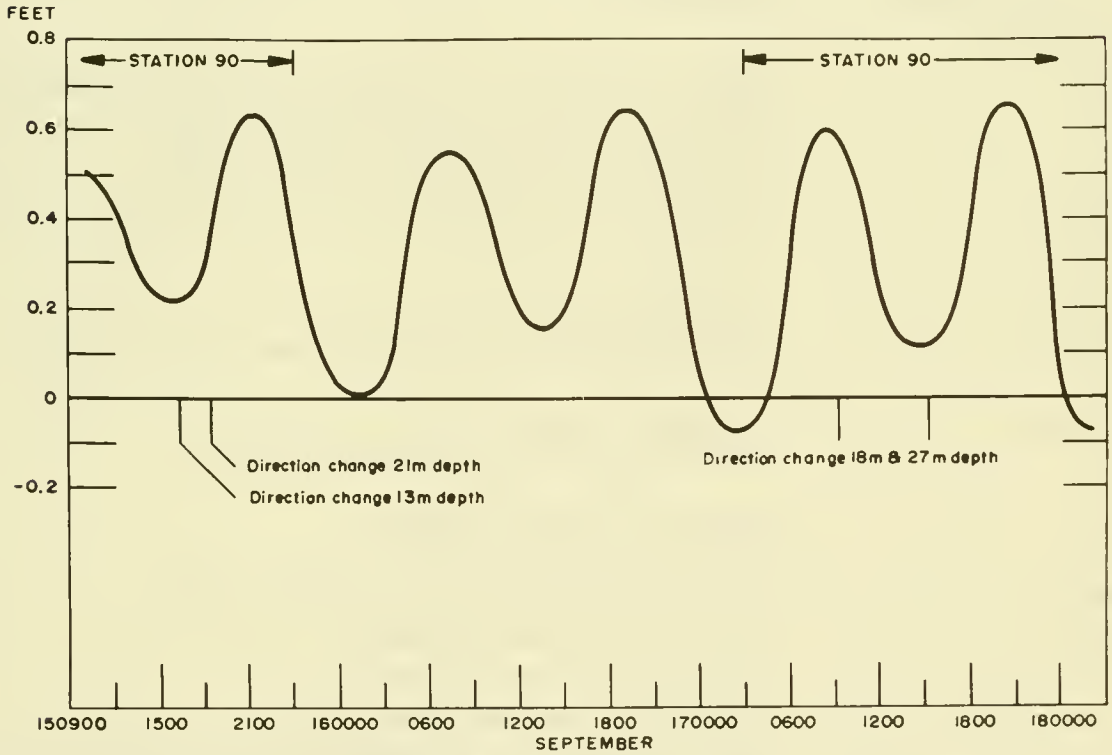

Figure 111.—Predicted tides curves for stations 90 and 94 taken from data from Flaxman Island, Alaska (U. S. Dept. of Commerce, 1970).

Appendix A.—Oceanographic Data

Cruises Listed

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Codes Utilized

A complete description of the codes utilized in the tabulation of oceanographic station data can be found in National Oceanographic Data Center publication M-2, Processing Physical and Chemical Data from Oceanographic Stations. (Rev. August 1964, supplement issued May, 1966.)

To facilitate use of the oceanographic station data listing, entry headings which are not self-explanatory are described below.

Depth to Bottom	Uncorrected sounding in meters.
MAX. DEPTH OF SAMPLES (if 2 digit code)	Depth of deepest sample in hundreds of meters to nearest hundred-meter interval.
or DNP (if 1 digit code)	For internal use only.
Wave observations	
DIR.	Rounded to nearest multiple of 10 degrees.
HGT.	Increments of ½m. Sum of 5 meters plus increments of ½ m. if 50 is added to direction.
PER.	If numerals 2 through 9 are entered, period in seconds is twice the numeric entry or 2X (numeric entry) +1. For other entries see WMO Code 3155.
SEA	Sea state according to WMO Code 3700.
Weather Code	If preceded by X, weather according to WMO Code 4501. If a two-digit entry, weather according to WMO Code 4677.
Cloud Code	
Type	Cloud type according to WMO Code 0500.
Amount	Cloud amount in eighths. Entry of the numeral 9 indicates cloud amount could not be estimated.
Water	
Color Code	Color according to Forel-Ule scale.
Trans.	Transparency in whole meters as determined by Secchi disc.
Wind	
Dir.	Rounded to nearest multiple of 10 degrees.
Speed	Letter S, indicates wind speed in knots.
Barometer	Barometric pressure given in tens, units, and tenths of millibars.
Air Temp. °C.	Air temperature to tenths of a degree Celsius.
Vis. Code	Visibility according to WMO Code 4300
No. obs. depths	Number of observed levels associated with the station
Messenger time	Entered in hours and tenths of an hour GMT. For Nansen casts, indicates time of release of messenger applicable to the observational level. For STD casts, indicates the starting time of lowering the sensor.

Card type	OBS designates observed levels. STD indicates the values of this standard level were interpolated by a modified 3-point LaGrange formula.
Depth (m.)	Depth to nearest meter. A postscript T indicates depth was obtained thermometrically; Z indicates uncorrected "wire out" depth. Postscript Q indicates value was marked doubtful by originator; P indicates value was considered doubtful by NODC. Postscripts P and Q retain this meaning throughout the following entries.
T °C	Temperature to hundredths of a degree Celsius.
S ‰	Salinity in parts-per-thousand.
SIGMA-T	Entered to hundredths.
Specific-volume	Multiply entry by 10^{-7} to obtain specific -volume anomaly in cubic centimeters per gram.
$\Sigma\Delta$D Dyn. M $\times 10^3$	Multiply entry by 10^{-3} to obtain anomaly of dynamic depth in dynamic meters referenced to the sea surface.
Sound Velocity	Sound velocity according to Wilson's formula to tenths of a meter per second.
O_2 ml/l	Dissolved oxygen in milliliters per liter entered to hundredths.
PO_4-P μg-at/l	Inorganic phosphate in microgram-atoms per liter entered to hundredths.
Total $-P\mu$g-at/l	Total phosphorus in microgram-atoms per liter entered to hundredths.
NO_2-N μg-at/l	Nitrite-nitrogen in microgram-atoms per liter entered to hundredths.
NO_3-N μg-at/l	Nitrate-nitrogen in microgram-atoms per liter entered to tenths.
SiO_4-Si μg-at/l	Silicate-silicon in microgram-atoms per liter entered to whole units.
pH	Entered to hundredths.

N O D C S T A T I O N D A T A

A R C H I V E L I S T I N G

REFIO 31 8286	YEAR 1971	BOTOP 00033	AIR TEMP 02.5	DIR HGT PER	WIND-DIR 29	INST NANSEN CAST	TEN SQ 1616
CONSEC 0001	MONTH 08	SHIP GL	WET BULB 02.5	00 0 X	WIND-SPD 08	TRACE DIR	5 SQUARE 1
LAT 70 16 N	DAY 20	DATA USE 1	BAROMETR 0996.7	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 143 40 W	HOUR 00.0	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X4	ORIG WBS 001	1 SQUARE 03

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
00.0	08S	00000	01.72	10.120	08.14		1423.8	08.29	0.00		0.06	00.8	003.	
00.0	08S	00005	01.01	21.239	17.04		1435.2	07.89	0.06		0.03	00.8	006.	
00.0	08S	00010	- 0.14	29.340	23.58		1441.0	08.74	0.19		0.08	01.4	005.	
00.0	08S	00020	- 1.33	31.310	25.20		1438.3	08.61	0.43		0.09	01.7	007.	
00.0	08S	00030	- 1.33	31.377	25.25		1438.5	08.51	0.49		0.04	01.0	008.	

N O D C S T A T I O N D A T A

REFIO 31 8286	YEAR 1971	BOTOP 00044	AIR TEMP 01.9	DIR HGT PER	WIND-DIR 25	INST NANSEN CAST	TEN SQ 1616
CONSEC 0002	MONTH 08	SHIP GL	WET BULB 01.8	00 0 X	WIND-SPD 08	TRACE DIR	5 SQUARE 1
LAT 70 25 N	DAY 20	DATA USE 1	BAROMETR 0998.1	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 143 40 W	HOUR 06.4	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X4	ORIG WBS 002	1 SQUARE 03

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
06.4	08S	00000	00.07	05.277	04.20		1409.6	08.84	0.46		0.03	01.7	004.	
06.4	08S	00005	- 0.75	25.726	20.68		1433.0	09.13	0.74		0.01	00.9	008.	
06.4	08S	00010	- 1.11	27.550	22.16		1433.9	09.35	1.56		0.03	01.2	006.	
06.4	08S	00020	- 1.28	30.577	24.60		1437.5	09.74	1.52		0.04	02.2	007.	
06.4	08S	00030	- 1.47	31.454	25.32		1438.0	08.09	1.83		0.05	03.4	011.	
06.4	08S	00040	- 1.46	31.576	25.42		1438.4	07.84	1.56		0.05	04.1	015.	

N O D C S T A T I O N D A T A

REFIO 31 8286	YEAR 1971	BOTOP 00080	AIR TEMP 01.0	DIR HGT PER	WIND-DIR 29	INST NANSEN CAST	TEN SQ 1616
CONSEC 0003	MONTH 08	SHIP GL	WET BULB 01.0	00 0 X	WIND-SPD 07	TRACE DIR	5 SQUARE 1
LAT 70 32.7N	DAY 20	DATA USE 1	BAROMETR 0999.7	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 143 37.4W	HOUR 14.6	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X4	ORIG WBS 004	1 SQUARE 03

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
14.6	08S	00000	00.04	03.934	03.11		1407.7	09.04	0.53		0.03	00.9	001.	
14.6	08S	00010	- 1.34	28.586	23.00		1434.3	09.34	0.81		0.04	01.2	004.	
14.6	08S	00030	- 1.39	30.767	24.76		1437.4	09.24	0.81		0.05	02.9	006.	
14.6	08S	00055	- 1.41	31.826	25.62		1439.2	07.56	1.13		0.08	05.8	020.	
14.6	08S	00080	- 1.20											

N O D C S T A T I O N D A T A

REFIO 31 8286	YEAR 1971	BOTOP 00507	AIR TEMP 01.2	DIR HGT PER	WIND-DIR 02	INST NANSEN CAST	TEN SQ 1616
CONSEC 0004	MONTH 08	SHIP GL	WET BULB 00.9	00 0 X	WIND-SPD 08	TRACE DIR	5 SQUARE 1
LAT 70 45.6N	DAY 21	DATA USE 1	BAROMETR 1003.2	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 143 42.3W	HOUR 01.6	AREA 10	CLOUD T/A 7/8	CL/TR	WEATHER X2	ORIG WBS 006	1 SQUARE 03

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
01.6	08S	00000	00.09	03.921	03.10		1407.9	09.25	0.10		0.21	12.0	003.	
01.6	08S	00010	- 1.31	29.031	23.35		1435.0	09.48	0.38		0.07	03.6	008.	
01.6	08S	00020	- 1.30	29.835	24.00		1436.4	09.53	0.44		0.16	10.0	006.	
01.6	08S	00030	- 1.48	30.721	24.72		1436.9	09.30	0.60		0.14	10.4	008.	
01.6	08S	00050	00.20	31.884	25.61		1446.7	09.48	0.71		0.17	11.2	014.	
01.6	08S	00075	- 0.56	32.287	25.96		1444.2	08.17	0.92		0.23	14.1	031.	
01.6	08S	00100	- 1.32	32.624	26.26		1441.5	07.25	1.17		0.23	15.7	039.	
01.6	08S	00150	- 1.44	33.323	26.83		1442.7	06.37	1.46		0.16	12.0	049.	
01.6	08S	T00200	- 0.78	34.193	27.51		1447.9	06.06	1.25		0.16	12.0	034.	
01.6	08S	00250	- 0.02	34.643	27.84		1452.8	06.02	1.11		0.18	12.4	023.	
01.6	08S	00300	00.22	34.771	27.93		1454.9	06.22	1.00		0.20	14.1	019.	
01.6	08S	T00400	00.43	34.845	27.98		1457.7	06.46	0.87		0.16	11.6	014.	
01.6	08S	00500	00.33	34.880	28.01		1458.9	06.54	0.88		0.19	12.8	020.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00503	AIR TEMP -01.2	DIR HGT PER	WIND-DIR 36	INST NANSEN CAST	TEN SQ 1616
CONSEC 0005	MONTH 08	SHIP GL	WET BULB -01.5	00 0 X	WIND-SPD 07	TRACE DIR	5 SQUARE 2
LAT 71 00.5N	DAY 22	DATA USE 1	BAROMETR 1010.0	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 145 35 W	HOUR 00.5	AREA 10	CLOUD T/A 7/3	CL/TR	WEATHER X1	ORIG WBS 007	1 SQUARE 15

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
00.5	OBS	00001	- 1.11	22.348	17.96		1426.6	09.25	0.11		0.05	00.1	005.	
00.5	OBS	00010	- 1.17	29.256	23.53		1436.0	09.62	0.42		0.04	00.1	005.	
00.5	OBS	00020	- 1.35	30.724	24.72		1437.4	09.42	0.53		0.05	00.1	005.	
00.5	OBS	00030	- 0.29	31.133	25.02		1443.1	08.92	0.69		0.09	01.1	008.	
00.5	OBS	00050	00.32	32.058	25.74		1447.5	08.56	0.75		0.07	01.4	011.	
00.5	OBS	00076	- 1.34	32.241	25.95		1440.5	07.68	1.14		0.06	06.8	019.	
00.5	OBS	00101	- 1.00	32.593	26.23		1443.0	07.61	1.31		0.07	11.5	025.	
00.5	OBS	00152	- 1.45	33.261	26.78		1442.6	06.38	1.61		0.11	16.6	037.	
00.5	OBS	T00202	- 0.77	34.156	27.48		1447.9	06.06	1.47		0.07	14.7	029.	
00.5	OBS	00253	- 0.08	34.615	27.82		1452.6	06.00	1.07		0.08	13.5	018.	
00.5	OBS	T00304	00.22	34.746	27.91		1455.0	06.18	1.05		0.19	13.1	014.	
00.5	OBS	T00405	00.40	34.882	28.01		1457.7	06.53	0.97		0.07	11.7	012.	
00.5	OBS	00506	00.36	34.867	28.00		1459.1	06.62	0.91		0.13	11.2	008.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00081	AIR TEMP -00.6	DIR HGT PER	WIND-DIR 02	INST NANSEN CAST	TEN SQ 1616
CONSEC 0006	MONTH 08	SHIP GL	WET BULB -01.0	00 0 X	WIND-SPD 07	TRACE DIR	5 SQUARE 2
LAT 70 48.5N	DAY 22	DATA USE 1	BAROMETR 1008.3	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 145 56.1W	HOUR 14.6	AREA 10	CLOUD T/A 6/6	CL/TR	WEATHER X1	ORIG WBS 008	1 SQUARE 05

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
14.6	OBS	00000	- 0.45	13.115	10.52		1417.3	08.85	0.10		0.04	00.0	007.	
14.6	OBS	00010	- 1.19	25.723	20.68		1431.0	09.44	0.25		0.03	00.1	006.	
14.6	OBS	00020	- 1.27	29.955	24.10		1436.7	09.43	0.36		0.03	00.1	006.	
14.6	OBS	00030	- 1.33	30.959	24.91		1438.0	09.28	0.53		0.03	00.2	007.	
14.6	OBS	00050	- 1.34	31.842	25.63		1439.5	07.42	0.94		0.09	04.0	020.	
14.6	OBS	00078	- 1.23	32.575	26.22		1441.5	07.29	0.98		0.09	05.9	030.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00053	AIR TEMP -00.2	DIR HGT PER	WIND-DIR 01	INST NANSEN CAST	TEN SQ 1616
CONSEC 0007	MONTH 08	SHIP GL	WET BULB -00.8	00 0 X	WIND-SPD 07	TRACE DIR	5 SQUARE 2
LAT 70 38.3N	DAY 22	DATA USE 1	BAROMETR 1008.4	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 146 00.8W	HOUR 20.8	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG WBS 010	1 SQUARE 06

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
20.8	OBS	00000	00.14	14.212	11.41		1421.6	08.31	0.00		0.26	02.5	010.	
20.8	OBS	00005	- 0.69	25.865	20.79		1433.5	09.14	0.67		0.16	02.5	008.	
20.8	OBS	00015	- 1.31	30.161	24.27		1436.7	08.38	0.90		0.33	02.0	010.	
20.8	OBS	00025	- 1.44	31.132	25.06		1437.6	09.51	1.08		0.44	02.5	011.	
20.8	OBS	00035	- 1.43	31.585	25.42		1438.4	07.60	1.39		0.66	05.1	019.	
20.8	OBS	00045	- 1.36	31.771	25.57		1439.2	07.46	1.60		0.93	05.4	020.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00033	AIR TEMP 00.0	DIR HGT PER	WIND-DIR 35	INST NANSEN CAST	TEN SQ 1616
CONSEC 0008	MONTH 08	SHIP GL	WET BULB -00.5	00 0 X	WIND-SPD 05	TRACE DIR	5 SQUARE 2
LAT 70 25.3N	DAY 23	DATA USE 1	BAROMETR 1006.8	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 146 08.0W	HOUR 00.7	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG WBS 011	1 SQUARE 06

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
00.7	OBS	00000	01.70	17.066	13.69		1432.8	08.32	0.09		0.08	03.8	010.	
00.7	OBS	00005	00.62	22.542	18.10		1435.1	08.61	0.13		0.05	03.8	009.	
00.7	OBS	00010	- 1.02	28.484	22.91		1435.6	09.53	0.24		0.05	03.0	009.	
00.7	OBS	00015	- 1.21	29.776	23.95		1436.6	09.81	0.44		0.07	04.6	010.	
00.7	OBS	00020	- 1.34	30.563	24.59		1437.2	09.84	0.51		0.08	05.7	014.	
00.7	OBS	00030	- 1.44	31.145	25.07		1437.7	08.58	0.60		0.05	01.9	011.	

N O D C S T A T I O N C A T A

REFID 31 8286	YEAR 1971	BOTOP 00025	AIR TEMP 00.1	DIR HGT PER	WIND-DIR 04	INST NANSEN CAST	TEN SQ 1616
CONSEC 0009	MONTH 08	SHIP GL	WET BULB -00.2	00 0 X	WIND-SPD 07	TRACE DIR	5 SQUARE 2
LAT 70 18.0N	DAY 23	DATA USE 1	BAROMETR 1008.7	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 146 05 W	HOUR 04.2	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG W8S 012	1 SQUARE 06

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
04.2	O8S	00000	00.13	09.597	07.69		1415.5	08.96	0.21		0.02	00.1	004.	
04.2	O8S	00005	- 0.18	25.921	20.83		1436.0	09.00	0.21		0.03	00.0	007.	
04.2	O8S	00010	- 0.80	28.346	22.79		1436.5	09.38	0.36		0.04	TRC	005.	
04.2	O8S	00015	- 1.15	30.138	24.25		1437.4	09.76	0.43		0.02	TRC	006.	
04.2	O8S	00023	- 1.33	30.827	24.81		1437.7	09.47	0.44		0.03	TRC	007.	

N O D C S T A T I O N C A T A

REFID 31 8286	YEAR 1971	BOTOP 00022	AIR TEMP -00.9	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1616
CONSEC 0010	MONTH 08	SHIP GL	WET BULB -01.2	00 0 X	WIND-SPD 05	TRACE DIR	5 SQUARE 2
LAT 70 20.7N	DAY 23	DATA USE 1	BAROMETR 1009.6	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 146 33.5W	HOUR 08.3	AREA 10	CLOUD T/A 6/6	CL/TR	WEATHER X2	ORIG W8S 013	1 SQUARE 06

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
08.3	O8S	00000	- 0.01	14.576	11.70		1421.4	08.48	0.05		0.02	00.3	006.	
08.3	O8S	00003	00.06	20.863	16.76		1430.2	08.49	0.35		0.02	00.2	005.	
08.3	O8S	00008	- 1.05	28.809	23.17		1435.9	09.54	0.40		0.01	00.1	004.	
08.3	O8S	00013	- 1.23	30.138	24.25		1437.0	09.60	0.34		0.02	00.1	006.	
08.3	O8S	00020	- 1.38	30.974	24.93		1437.6	08.42	0.70		0.03	00.7	009.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00027	AIR TEMP -00.6	DIR HGT PER	WIND-DIR 05	INST NANSEN CAST	TEN SQ 1616
CONSEC 0011	MONTH 08	SHIP GL	WET BULB -01.0	00 0 X	WIND-SPD 07	TRACE DIR	5 SQUARE 2
LAT 70 25.0N	DAY 23	DATA USE 1	BAROMETR 1009.9	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 05.0W	HOUR 11.4	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X7	ORIG W8S 014	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
11.4	O8S	00000	01.45	17.339	13.92		1432.0	08.24			0.03	00.3		
11.4	O8S	00005	00.36	24.348	19.55		1436.4	08.67			0.05	00.4		
11.4	O8S	00010	- 1.07	29.296	23.56		1436.5	09.45			0.03	00.2		
11.4	O8S	00015	- 1.26	30.173	24.28		1436.9	09.37			0.05	00.4		
11.4	O8S	00020	- 1.42	31.221	25.13		1437.7	07.98			0.06	01.0		
11.4	O8S	00025	- 1.44	31.342	25.23		1437.9	07.93			0.09	01.5		

N O D C S T A T I O N C A T A

REFID 31 8286	YEAR 1971	BOTOP 00036	AIR TEMP -00.6	DIR HGT PER	WIND-DIR 05	INST NANSEN CAST	TEN SQ 1616
CONSEC 0012	MONTH 08	SHIP GL	WET BULB -00.9	00 0 X	WIND-SPD 08	TRACE DIR	5 SQUARE 2
LAT 70 36.5N	DAY 23	DATA USE 1	BAROMETR 1010.0	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 00.0W	HOUR 15.6	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG W8S 015	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
15.6	O8S	00000	- 1.10	17.486	14.03		1420.0	08.59			0.05	00.4		
15.6	O8S	00005	01.25	23.899	19.16		1439.9	08.40			0.06	00.5		
15.6	O8S	00010	00.50	27.942	22.43		1442.0	09.03			0.07	00.7		
15.6	O8S	00020	- 1.04	30.710	24.71		1438.8	09.09			0.07	00.8		
15.6	O8S	00030	- 1.43	31.348	25.23		1438.0	08.02			0.09	01.2		
15.6	O8S	00034	- 1.39	31.622	25.45		1438.7	07.71			0.11	02.1		

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00039	AIR TEMP 00.5	DIR HGT PER	WIND-DIR 36	INST NANSEN CAST	TEN SQ 1616
CONSEC 0013	MONTH 08	SHIP GL	WET BULB 00.0	00 0 X	WIND-SPD 08	TRACE DIR	5 SQUARE 2
LAT 70 45 N	DAY 23	DATA USE 1	BAROMETR 1010.2	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 00 W	HOUR 21.6	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X1	ORIG WBS 016	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
21.6	OBS	00000	00.01	14.323	11.50		1421.2	08.68	0.21		0.02	00.0	009.	
21.6	OBS	00005	00.01	25.410	20.41		1436.2	08.68	0.57		0.02	00.2	009.	
21.6	OBS	00010	- 0.13	28.530	22.92		1439.9	09.16	0.76		0.03	00.2	011.	
21.6	OBS	00015	- 0.77	30.123	24.23		1439.2	09.65	0.94		0.02	00.2	008.	
21.6	OBS	00025	- 0.63	31.586	25.40		1442.0	07.74	1.13		0.03	00.6	008.	
21.6	OBS	00035	- 1.03	31.902	25.67		1440.8	08.84	1.35		0.06	02.0	011.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00502	AIR TEMP -02.3	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1616
CONSEC 0014	MONTH 08	SHIP GL	WET BULB -02.4	00 0 X	WIND-SPD 05	TRACE DIR	5 SQUARE 2
LAT 71 00 N	DAY 24	DATA USE 1	BAROMETR 1010.3	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 04 W	HOUR 12.5	AREA 10	CLOUD T/A X/0	CL/TR	WEATHER X4	ORIG WBS 019	1 SQUARE 17

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
12.5	OBS	00000	- 0.56	14.910	11.96		1419.2	08.98	0.25		0.03	00.0	005.	
12.5	OBS	00010	- 0.93	26.556	21.35		1433.4	09.33	0.54		0.03	00.4	004.	
12.5	OBS	00020	- 0.58	29.978	24.11		1438.1	09.53	0.70		0.01	00.7	004.	
12.5	OBS	00029	- 1.19	31.023	24.96		1438.7	06.86	0.78		0.08	03.6	008.	
12.5	OBS	00049	00.04	31.993	25.70		1446.1	08.58	0.84		0.09	04.0	012.	
12.5	OBS	00073	- 0.89	32.376	26.05		1442.7	07.90	1.13		0.09	05.8	020.	
12.5	OBS	00097	- 1.38	32.731	26.35		1441.3	07.12	1.37		0.10	07.7	030.	
12.5	OBS	00146	- 1.30	33.613	27.06		1443.7	06.13	1.64		0.06	09.2	038.	
12.5	OBS	00195	- 0.20	34.534	27.76		1451.0	05.95	1.49		0.03	07.3	020.	
12.5	OBS	00244	- 0.20	34.755	27.94		1452.1	06.26	1.07		0.05	07.7	020.	
12.5	OBS	00292	00.33	34.976	28.05		1455.6	06.52	1.00		0.06	08.1	018.	
12.5	OBS	00388	00.41						0.89		0.05	09.3	014.	
12.5	OBS	00484	00.39						0.78		0.05	06.6	013.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00844	AIR TEMP -02.3	DIR HGT PER	WIND-DIR 03	INST STL RECORDER	TEN SQ 1616
CONSEC 0015	MONTH 08	SHIP GL	WET BULB -02.4	00 0 X	WIND-SPD 05	TRACE DIR 0	5 SQUARE 2
LAT 71 00 N	DAY 24	DATA USE 1	BAROMETR 1010.3	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 04 W	HOUR 21.7	AREA 10	CLOUD T/A	CL/TR	WEATHER X4	ORIG WBS 019	1 SQUARE 17

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
21.7	OBS	00008	- 1.07											
	OBS	00010	- 1.13											
	OBS	00015	- 1.18	30.12	24.23		1437.2							
	OBS	00016	- 0.97	30.30	24.37		1438.5							
	OBS	00020	- 1.15	30.68	24.68		1438.3							
	OBS	00025	- 0.83	31.01	24.94		1440.3							
	OBS	00030	- 0.49	31.46	25.29		1442.6							
	OBS	00034	00.75	32.01 Q	25.680									
	OBS	00044	00.90	32.07 Q	25.72Q									
	OBS	00047	00.57	32.11	25.77		1448.7							
	OBS	00049	00.56	32.16	25.81		1448.7							
	OBS	00050	00.50	32.16	25.82		1448.5							
	OBS	00068	- 0.72	32.27	25.96		1443.3							
	OBS	00073	- 0.52	32.51	26.14		1444.6							
	OBS	00081	- 0.63	32.83	26.40		1444.7							
	OBS	00100	- 1.35	32.95	26.52		1441.8							
	OBS	00125	- 1.47	33.25	26.77		1442.1							
	OBS	00136	- 1.46	33.34	26.84		1442.4							
	OBS	00150	- 1.32	33.75	27.17		1443.9							
	OBS	00200	- 0.19	34.66	27.86		1451.3							
	OBS	00250	00.18	34.83	27.98		1454.0							
	OBS	00300	00.36	34.91	28.03		1455.8							
	OBS	00370	00.42	34.95	28.06		1457.3							
	OBS	00400	00.41	34.96	28.07		1457.7							
	OBS	00500	00.31	34.98	28.09		1459.0							
	OBS	00600	00.18	34.99	28.11		1460.1							
	OBS	00700	00.08	34.99	28.11		1461.3							
	OBS	00780	- 0.02	35.01	28.14		1462.2							

N O O C S T A T I O N O A T A

REFIO 31 8286	YEAR 1971	BOTOP 02000	AIR TEMP -01.6	DIR HGT PER	WIND-DIR 06	INST STD PECORDER	TEN SQ 1616
CONSEC 0016	MONTH 08	SHIP GL	WET BULB -01.7	00 0 X	WIND-SPO 10	TRACE DIR D	5 SQUARE 2
LAT 71 13.7N	OAY 25	OATA USE 1	BAROMETR 1010.7	SEA	WIND-FOR	OURATION	2 SQUARE 06
LONG 147 26.6W	HOUR 03.1	AREA 10	CLOUD T/A	CL/TR	WEATHER X4	ORIG WBS U20	1 SQUARE 17

CASTNUM/TIME	LVLTYP	OEPTH	TEMP	SAL	SIGMA-T	OYNOPTH	SNO VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
03.1	OBS	00010	- 0.92											
	OBS	00011	- 0.87											
	OBS	00020	- 1.16	30.61	24.63		1438.1							
	OBS	00028	- 1.30	30.77	24.76		1437.8							
	OBS	00030	- 0.20	31.56	25.36		1444.1							
	OBS	00050	- 1.34	31.82	25.61		1439.4							
	OBS	00075	- 1.43	32.36	26.05		1440.2							
	OBS	00100	- 1.50	32.69	26.32		1440.7							
	OBS	00125	- 1.54	32.98	26.55		1441.4							
	OBS	00150	- 1.51	33.20	26.73		1442.2							
	OBS	00200	- 0.98	34.14	27.48		1446.9							
	OBS	00250	- 0.03	34.72	27.90		1452.9							
	OBS	00300	00.23	34.85	27.99		1455.1							
	OBS	00400	00.39	34.92	28.04		1457.6							
	OBS	00500	00.39	34.97	28.08		1459.3							
	OBS	00600	00.30	34.97	28.09		1460.6							
	OBS	00700	00.17	34.97	28.09		1461.7							
	OBS	00800	00.05	35.02	28.14		1462.9							
	OBS	00900	- 0.06	35.01	28.14		1464.0							
	OBS	01000	- 0.13	35.02	28.15		1465.4							
	OBS	01100	- 0.20	35.03	28.16		1466.8							
	OBS	01200	- 0.25	35.03	28.16		1468.2							
	OBS	01300	- 0.30	35.04	28.17		1469.7							
	OBS	01400	- 0.33	35.04	28.18		1471.3							
	OBS	01500	- 0.37	35.05	28.19		1472.8							

N O O C S T A T I O N O A T A

REFIO 31 8286	YEAR 1971	BOTOP 02000	AIR TEMP -01.6	DIR HGT PER	WIND-DIR 06	INST NANSEN CAST	TEN SQ 1616
CONSEC 0017	MONTH 08	SHIP GL	WET BULB -01.7	00 0 X	WIND-SPO 10	TRACE DIR	5 SQUARE 2
LAT 71 13.7N	OAY 25	OATA USE 1	BAROMETR 1010.7	SEA	WIND-FOR	OURATION	2 SQUARE 06
LONG 147 26.6W	HOUR 06.3	AREA 10	CLOUD T/A 7/8	CL/TR	WEATHER X4	ORIG WBS 020	1 SQUARE 17

CASTNUM/TIME	LVLTYP	OEPTH	TEMP	SAL	SIGMA-T	OYNOPTH	SNO VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
06.3	OBS	00000	- 0.65	25.154	20.22		1432.6	08.51	0.83		0.02	00.0	010.	
06.3	OBS	00010	- 0.89	27.205	21.87		1434.5	08.90	0.82		0.04	00.1	006.	
06.3	OBS	00025	- 1.20	30.539	24.57		1437.9	09.38	1.55		0.03	00.1	009.	
06.3	OBS	00050	01.30	31.768	25.46		1451.5	08.90	1.47		0.10	01.2	012.	
06.3	OBS	00100	01.15					08.51	1.05		0.03	00.1	011.	
06.3	OBS	00200	- 1.50	32.450	26.12		1442.1	07.27	1.69		0.06	09.3	026.	
06.3	OBS	00300	- 1.15	33.648	27.08		1447.0	05.95	2.00		0.04	17.7	040.	
06.3	OBS	00500	00.35	34.786	27.93		1458.9	06.20	1.41		0.05	16.0	016.	
06.3	OBS	00750	00.38	34.865	28.00		1463.3	06.50	1.27		0.03	13.7	012.	
06.3	OBS	01000	00.17	34.886	28.03		1466.6	06.59	0.91		0.04	14.6	012.	
06.3	OBS	01250	- 0.02	34.897	28.04		1469.9	06.66	0.39		0.10	15.0	012.	
06.3	OBS	01500	- 0.17	34.903	28.06		1473.5	06.80	0.89		0.06	14.6	012.	
06.3	OBS	01750	- 0.25	34.904	28.06		1477.4	06.83	0.85		0.08	15.0	012.	
06.3	OBS	01800	- 0.27	34.921	28.08		1478.2	06.69	0.84		0.12	15.0	014.	

N O O C S T A T I O N D A T A

REFIO 31 8286	YEAR 1971	BOTOP 02200	AIR TEMP -01.6	DIR HGT PER	WIND-DIR 10	INST STD RECORDER	TEN SQ 1616
CONSEC 0018	MONTH 08	SHIP GL	WET BULB -01.6	00 0 X	WIND-SPD 04	TRACE DIR 0	5 SQUARE 2
LAT 71 22.8N	DAY 26	DATA USE 1	BAROMETR 1013.2	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 55.2W	HOUR 11.0	AREA 10	CLOUD T/A	CL/TR	WEATHER X4	ORIG WBS 021	1 SQUARE 17

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
11.0	OBS	00000						08.61	0.55		0.05	00.5	007.	
	OBS	00006	- 0.83											
	OBS	00010	- 0.50											
	OBS	00011	- 0.75											
	OBS	00018	00.21	30.72	24.67		1444.6							
	OBS	00020	- 0.18	30.76	24.72		1442.9							
	OBS	00025	- 1.10	31.37	25.24		1439.5	08.92	0.10		0.07	00.6	010.	
	OBS	00030	02.25	31.62	25.27		1455.2							
	OBS	00032	02.67	31.75	25.35		1457.3							
	OBS	00050	01.42	31.99	25.63		1452.4	08.89	0.88		0.06	00.7	011.	
	OBS	00075	- 0.25	32.24	25.91		1445.5	08.28	1.14		0.09	02.6	015.	
	OBS	00084	- 0.75	32.42	26.08		1443.6							
	OBS	00090	- 0.65	32.59	26.21		1444.4							
	OBS	00100	- 1.07	32.59	26.23		1442.6	07.76	1.39		0.09	05.0	026.	
	OBS	00112	- 0.86	32.74	26.34		1444.0							
	OBS	00125	- 1.24	32.91	26.49		1442.7							
	OBS	00150	- 1.40	33.18	26.71		1442.7							
	OBS	00155	- 1.46	33.18	26.71		1442.5	06.67	1.72		0.10	10.5	038.	
	OBS	00180	- 1.39	33.62	27.07		1443.9							
	OBS	00200	- 1.10	34.03	27.35		1446.2	05.96	1.69		0.03	10.9	036.	
	OBS	00246	- 0.13	34.70	27.85		1452.4							
	OBS	00250	- 0.10	34.71	27.90		1452.6							
	OBS	00300	00.20	34.87	28.01		1455.0							
	OBS	00380	00.39	34.95	28.06		1457.3	06.22	1.20		0.03	10.1	018.	
	OBS	00400	00.38	34.96	28.07		1457.6							
	OBS	00500	00.43	35.00	28.10		1459.5	06.52	0.99		0.02	09.8	015.	
	OBS	00600	00.31	35.00	28.11		1460.7							
	OBS	00700	00.18	35.01	28.12		1461.8							
	OBS	00750	00.10	35.02	28.14		1462.3	06.66	0.91		0.01	09.8	014.	
	OBS	00800	00.05	35.02	28.14		1462.9							
	OBS	00900	- 0.07	35.03	28.15		1464.0	06.72	0.87		0.02	10.2	014.	
	OBS	01000	- 0.15	35.04	28.17		1465.3							
	OBS	01100	- 0.22	35.04	28.17		1466.7							
	OBS	01152	- 0.25	35.05	28.18		1467.5	06.68	0.85		0.02	10.5	016.	
	OBS	01200	- 0.27	35.05	28.18		1468.2							
	OBS	01300	- 0.31	35.05	28.18		1469.7							
	OBS	01400	- 0.34	35.06	28.19		1471.3							
	OBS	01500	- 0.36	35.06	28.19		1472.9	06.61	0.85		0.54	10.7	016.	

N O O C S T A T I O N D A T A

REFIO 31 8286	YEAR 1971	BOTOP 01006	AIR TEMP 00.7	DIR HGT PER	WIND-DIR 07	INST STD RECORDER	TEN SQ 1616
CONSEC 0019	MONTH 08	SHIP GL	WET BULB 00.6	00 0 X	WIND-SPD 04	TRACE DIR :	5 SQUARE 2
LAT 71 09.4N	DAY 27	DATA USE 1	BAROMETR 1016.3	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 00.4W	HOUR 04.4	AREA 10	CLOUD T/A	CL/TR	WEATHER X1	ORIG WBS 022	1 SQUARE 18

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
04.4	OBS	00000						08.55	0.12		0.08	00.5	009.	
	OBS	00004	- 1.02											
	OBS	00010	- 0.88					08.66	0.82		0.07	01.4	010.	
	OBS	00020	- 0.72	30.64	24.64		1440.2							
	OBS	00025	00.00	31.32	25.16		1444.6	08.82	0.75		0.03	00.2	009.	
	OBS	00030	00.35	31.50	25.29		1446.5							
	OBS	00037	01.05	31.70	25.42		1450.1							
	OBS	00040	00.50	31.70	25.45		1447.7							
	OBS	00050	- 0.75	31.94	25.69		1442.4	08.48	0.98		0.14	04.2	013.	
	OBS	00060	- 0.90	32.16	25.87		1442.2							
	OBS	00064	- 0.82	32.23	25.93		1442.7							
	OBS	00068	00.15	32.32	25.96		1447.4							
	OBS	00075	- 0.50	32.36	26.02		1444.5	07.18	1.09		0.14	05.3	018.	
	OBS	00082	- 1.11	32.39	26.07		1441.9							
	OBS	00091	- 0.80	32.64	26.26		1443.8							
	OBS	00100	- 1.10	32.70	26.32		1442.6	07.30	1.41		0.08	07.0	024.	
	OBS	00123	- 1.49	32.97	26.54		1441.6							
	OBS	00150	- 1.48	33.35	26.85		1442.6	06.27	1.81		0.08	10.8	036.	
	OBS	00200	- 0.47	34.49	27.74		1449.7	05.95	1.63		0.06	09.6	024.	
	OBS	00220	- 0.12	34.71	27.90		1452.0							
	OBS	00225	- 0.10	34.71	27.90		1452.2		1.32		0.15	07.0	026.	
	OBS	00250	00.09	34.80	27.98		1453.6							
	OBS	00300	00.24	34.87	28.01		1455.2		0.91		0.06	10.3	015.	
	OBS	00400	00.38	34.94	28.06		1457.6							
	OBS	00450	00.41	34.95	28.06		1458.6	06.34	0.88		0.06	10.3	012.	
	OBS	00500	00.39	34.97	28.08		1459.3							
	OBS	00600	00.34	35.00	28.11		1460.8	06.54	0.89		0.06	09.6	011.	
	OBS	00700	00.27	35.00	28.11		1462.2							
	OBS	00775	00.20	35.00	28.12		1463.1	06.50	0.84		0.07	10.5	011.	
	OBS	00800	00.18	35.01	28.12		1463.4							
	OBS	00900	00.09	35.01	28.13		1464.7	06.61	0.83		0.07	09.3	011.	

N O O C S T A T I O N D A T A

REFIO	31 8286	YEAR 1971	BOTOP 00027	AIR TEMP	01.1	DIR HGT PER	WIND-DIR 08	INST NANSEN CAST	TEN SQ 1616
CONSEC	0020	MONTH 08	SHIP GL	WET BULB	01.1	00 0 X	WIND-SPD 04	TRACE DIR	5 SQUARE 2
LAT	70 38.4N	DAY 27	DATA USE 1	BAROMETR	1017.3	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG	148 04.0W	HOUR 17.5	AREA 10	CLOUD T/A	6/7	CL/TR	WEATHER X1	ORIG W8S 023	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
17.5	OBS	00000	00.15	20.507	16.47		1430.1	08.74	0.04		0.03	00.4	008.	
17.5	OBS	00005	- 0.14	26.591	21.36		1437.1	09.12	0.37		0.07	00.6	006.	
17.5	OBS	00010	- 0.38	28.364	22.80		1438.5	09.18	0.43		0.06	00.8	000.	
17.5	OBS	00015	- 0.92	30.441	24.49		1438.9	08.90	0.54		0.13	01.7	007.	
17.5	OBS	00020	- 1.29	31.360	25.24		1438.5	08.26	0.63		0.12	01.1	009.	

N O O C S T A T I O N D A T A

REFIO	31 8286	YEAR 1971	BOTOP 00029	AIR TEMP	00.5	DIR HGT PER	WIND-DIR 00	INST NANSEN CAST	TEN SQ 1616
CONSEC	0021	MONTH 08	SHIP GL	WET BULB	00.3	00 0 X	WIND-SPD 00	TRACE DIR	5 SQUARE 2
LAT	70 38.4N	DAY 28	DATA USE 1	BAROMETR	1019.4	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG	148 04.0W	HOUR 22.5	AREA 10	CLOUD T/A	7/8	CL/TR	WEATHER X4	ORIG W8S 024	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
22.5	OBS	00000	00.50	17.902	14.38		1428.3	08.32	0.15		0.10	00.3	013.	
22.5	OBS	00005	- 0.33	26.962	21.67		1436.7	09.00	0.74		0.05	00.3	009.	
22.5	OBS	00010	- 0.34	29.071	23.37		1439.7	09.20	0.88		0.06	01.2	008.	
22.5	OBS	00015	- 0.87	30.033	24.16		1438.6	09.23	0.93		3.17	02.8	008.	
22.5	OBS	00020	- 1.15	31.027	24.96		1438.7	08.67	0.94		0.19	03.7	011.	

N O O C S T A T I O N D A T A

REFIO	31 8286	YEAR 1971	BOTOP 00029	AIR TEMP	00.5	DIR HGT PER	WIND-DIR 33	INST NANSEN CAST	TEN SQ 1616
CONSEC	0022	MONTH 08	SHIP GL	WET BULB	00.5	00 0 X	WIND-SPD 11	TRACE DIR	5 SQUARE 2
LAT	70 31.2N	DAY 29	DATA USE 1	BAROMETR	1017.7	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG	147 31.2W	HOUR 03.4	AREA 10	CLOUD T/A	7/8	CL/TR	WEATHER X5	ORIG W8S 025	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
03.4	OBS	00000	00.48	15.110	12.14		1424.5	08.74	0.16		0.05	00.1	006.	
03.4	OBS	00005	- 0.26	26.596	21.37		1436.5	09.28	0.58		0.07	00.3	010.	
03.4	OBS	00010	- 0.60	28.755	23.12		1438.0	09.45	0.79		0.11	00.4	010.	
03.4	OBS	00023	- 1.27	31.064	25.00		1438.3	08.12						

N O O C S T A T I O N D A T A

REFIO	31 8286	YEAR 1971	BOTOP 00048	AIR TEMP	-00.2	DIR HGT PER	WIND-DIR 26	INST NANSEN CAST	TEN SQ 1616
CONSEC	0023	MONTH 08	SHIP GL	WET BULB	-00.2	00 0 X	WIND-SPD 08	TRACE DIR	5 SQUARE 2
LAT	70 54.5N	DAY 29	DATA USE 1	BAROMETR	1014.9	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG	147 26.5W	HOUR 10.5	AREA 10	CLOUD T/A	7/8	CL/TR	WEATHER X5	ORIG W8S 027	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
10.5	OBS	00000	- 0.24	14.556	11.68		1420.3	08.85	0.08		0.11	00.4	008.	
10.5	OBS	00005	- 0.49	23.520	18.90		1431.2	08.87	0.22		0.04	00.1	011.	
10.5	OBS	00010	- 0.89	27.680	22.26		1435.1	09.32	0.64		0.04	00.3	009.	
10.5	OBS	00020	- 1.14	30.131	24.24		1437.5	09.62	0.87		0.08	00.3	011.	
10.5	OBS	00030	01.62	31.376	25.12		1452.1	08.76	0.87		0.14	00.6	014.	
10.5	OBS	00047	01.09	31.756	25.46		1450.5	08.51	1.19		0.26	01.0	020.	

N O D C S T A T I O N D A T A

REFIO 31 8286	YEAR 1971	BOTDP 00105	AIR TEMP 00.7	DIR HGT PER	WIND-DIR 29	INST NANSEN CAST	TEN SQ 1616
CONSEC 0024	MONTH 08	SHIP GL	WET BULB 00.7	00 0 X	WIND-SPD 18	TRACE DIR	5 SQUARE 2
LAT 70 59 N	DAY 29	DATA USE 1	BAROMETR 1010.6	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 24 W	HOUR 19.0	AREA 10	CLOUD T/A 7/8	CL/TR	WEATHER X7	ORIG WBS 028	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
19.0	OBS	00000	- 0.48	14.982	12.02		1419.7	08.98	0.00		0.08	00.3	014.	
19.0	OBS	00005	- 0.82	26.242	21.10		1433.4	09.26	0.41		0.07	00.1	015.	
19.0	OBS	00010	- 0.98	27.918	22.45		1435.1	09.42	0.61		0.11	00.7	017.	
19.0	OBS	00020	- 1.06	30.095	24.21		1437.9	09.56	0.75		0.06	00.3	018.	
19.0	OBS	00025	- 0.55	30.750	24.72		1441.2	09.29	0.75		0.14	00.8	021.	
19.0	OBS	00030	- 0.69	31.202	25.09		1441.3	09.08	0.86		0.18	00.8	020.	
19.0	OBS	00035	00.05	31.373	25.20		1445.1	08.80	0.82		0.17	01.0	026.	
19.0	OBS	00050	00.10	31.975	25.69		1446.4	08.42	1.02		0.28	02.0	030.	
19.0	OBS	00075	- 0.56	32.274	25.95		1444.1	07.99	1.18		0.18	03.1	037.	
19.0	OBS	00090	- 0.80	32.392	26.06		1443.4	07.84	1.35		0.23	04.0	039.	

N O D C S T A T I O N D A T A

REFIO 31 8286	YEAR 1971	BOTDP 00550	AIR TEMP -02.8	DIR HGT PER	WIND-DIR 32	INST STD RECORDER	TEN SQ 1616
CONSEC 0025	MONTH 08	SHIP GL	WET BULB -03.2	00 0 X	WIND-SPD 06	TRACE DIR D	5 SQUARE 2
LAT 71 07.8N	DAY 30	DATA USE 1	BAROMETR 1015.0	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 01.3W	HOUR 02.0	AREA 10	CLOUD T/A	CL/TR	WEATHER X7	ORIG WBS 029	1 SQUARE 18

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
02.0	OBS	00000						08.56	0.59		0.12	00.3	006.	
	OBS	00010	- 1.03					09.27	0.65		0.10	00.1	004.	
	OBS	00014	- 0.98											
	OBS	00020	- 0.28	30.31	24.36		1441.8	09.26	0.81		0.09	00.2	007.	
	OBS	00024	00.00	31.00	24.91		1444.1							
	OBS	00027	- 0.80	31.10	25.01		1440.6							
	OBS	00030	- 0.60	31.24	25.12		1441.8							
	OBS	00033	- 0.75	31.33	25.20		1441.3							
	OBS	00038	00.05	31.86	25.60		1445.8							
	OBS	00048	00.57	32.06	25.73		1448.6							
	OBS	00050	00.10	32.08	25.77		1446.5	08.44	1.06		0.19	02.0	013.	
	OBS	00054	- 1.34	32.16	25.89		1440.0							
	OBS	00060	- 1.28	32.31	26.01		1440.6							
	OBS	00066	- 1.37	32.41	26.09		1440.4							
	OBS	00069	- 1.28	32.42	26.09		1440.9							
	OBS	00075	- 1.38	32.51	26.17		1440.6							
	OBS	00090	- 1.47	32.72	26.34		1440.8							
	OBS	00094	- 1.13	32.88	26.46		1442.6							
	OBS	00100	- 1.14	32.89	26.47		1442.7	07.54	1.51		0.21	07.6	028.	
	OBS	00125	- 1.25	33.05	26.60		1442.8	07.30	1.72		0.21	10.7	034.	
	OBS	00150	- 1.38	33.26	26.78		1442.9							
	OBS	00175	- 1.35					06.62	1.17		0.19	10.7	014.	
	OBS	00196	- 1.31	33.58	27.03		1444.5							
	OBS	00200	- 1.28	33.83	27.24		1445.0							
	OBS	00250	- 0.55	34.43	27.69		1450.1	06.04	1.11		0.13	10.2	013.	
	OBS	00300	00.01	34.75	27.92		1454.0							
	OBS	00375	00.27	34.89	28.02		1456.6	06.32	1.07		0.14	07.9	031.	
	OBS	00400	00.31	34.91	28.04		1457.2	06.37	1.05		0.21	10.8	025.	
	OBS	00500	00.38	34.95	28.07		1459.2	06.55	0.95		0.18	09.9	015.	
	OBS	00600	00.36	34.99	28.10		1460.9							

N O D C S T A T I O N D A T A

REFIO 31 8286	YEAR 1971	BOTDP 00093	AIR TEMP -02.2	DIR HGT PER	WIND-DIR 29	INST NANSEN CAST	TEN SQ 1616
CONSEC 0026	MONTH 08	SHIP GL	WET BULB -02.3	00 0 X	WIND-SPD 05	TRACE DIR	5 SQUARE 2
LAT 71 05 N	DAY 30	DATA USE 1	BAROMETR 1016.7	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 58 W	HOUR 11.9	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG WBS 030	1 SQUARE 17

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
11.9	OBS	00000	- 0.74	21.430	17.22		1427.1	08.69	0.44		0.04	00.0	003.	
11.9	OBS	00005	- 0.86	24.554	19.74		1430.9	08.94	0.54		0.05	00.1	004.	
11.9	OBS	00010	- 1.04	27.086	21.78		1433.6	09.28	0.69		0.02	00.1	004.	
11.9	OBS	00020	- 0.58	29.862	24.01		1439.8	09.41	0.84		0.06	00.1	004.	
11.9	OBS	00025	- 0.17	30.747	24.71		1443.0	09.15	0.91		0.07	00.2	005.	
11.9	OBS	00030	- 0.62	30.978	24.91		1441.3	08.97	0.99		0.11	00.6	009.	
11.9	OBS	00035	- 0.06	31.313	25.16		1444.5	08.79	1.05		0.17	00.9	009.	
11.9	OBS	00050	- 0.09	32.090	25.79		1445.7	08.41	1.27		0.19	02.2	015.	
11.9	OBS	00070	- 0.29	32.146	25.84		1445.1	08.38	1.33		0.14	02.2	015.	
11.9	OBS	00090	- 0.95	32.581	26.21		1443.0	07.75	1.62		0.19	04.5	024.	

N D D C S T A T I O N D A T A

REFID	31 8286	YEAR 1971	BDTOP 00052	AIR TEMP	-02.9	DIR HGT PER		WIND-DIR 33		INST NANSEN CAST		TEN SQ 1616
CONSEC	0027	MONTH 08	SHIP GL	WET BULB	-03.2	00 0 X		WIND-SPD 06		TRACE DIR		5 SQUARE 2
LAT	71 05 N	DAY 30	DATA USE 1	BAROMETR	1017.2	SEA		WIND-FOR		DURATION		2 SQUARE 06
LONG	147 58 W	HOUR 17.6	AREA 10	CLOUD T/A	6/7	CL/TR		WEATHER	X7	ORIG WBS 031		1 SQUARE 17

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
17.6	DBS	00000	- 0.86	18.954	15.22		1423.2	08.56	0.20		0.02	00.0	003.	
17.6	DBS	00005	- 1.04	25.412	20.43		1431.2	08.84	0.52		0.10	00.3	003.	
17.6	DBS	00010	- 1.04	27.672	22.25		1434.4	09.07	0.66		0.04	00.1	004.	
17.6	DBS	00020	- 0.45	29.697	23.87		1440.2	09.13	0.78		0.04	00.1	005.	
17.6	DBS	00025	00.06	30.660	24.63		1444.0	08.61	0.90		0.04	00.2	006.	
17.6	DBS	00030	00.35	30.967	24.88		1445.8	08.59	0.90		0.09	00.3	008.	
17.6	DBS	00035	00.66	31.252	25.08		1447.7	09.53	0.85		0.13	00.6	008.	
17.6	DBS	00040	- 0.25	31.431	25.26		1443.8	08.54	0.96		0.13	00.8	010.	
17.6	DBS	00050	00.94	31.812	25.51		1450.0	08.11	0.99		0.15	01.1	015.	

N D D C S T A T I O N D A T A

REFID	31 8286	YEAR 1971	BDTOP 00043	AIR TEMP	-02.7	DIR HGT PER		WIND-DIR 22		INST NANSEN CAST		TEN SQ 1616
CONSEC	0028	MONTH 08	SHIP GL	WET BULB	-02.7	00 0 X		WIND-SPD 04		TRACE DIR		5 SQUARE 2
LAT	70 49.5N	DAY 30	DATA USE 1	BAROMETR	1018.2	SEA		WIND-FOR		DURATION		2 SQUARE 08
LONG	148 01 W	HOUR 23.2	AREA 10	CLOUD T/A	6/6	CL/TR		WEATHER	X1	ORIG WBS 033		1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
23.2	DBS	00000	- 0.08	07.798	06.23		1412.1	09.31	0.12		0.00	00.0	002.	
23.2	DBS	00005	- 0.90	24.658	19.82		1430.9	08.80	0.45		0.04	00.1	006.	
23.2	DBS	00010	- 0.77	26.238	21.09		1433.7	08.96	0.53		0.18	00.4	004.	
23.2	DBS	00015	- 0.18	28.726	23.08		1440.0	09.22	0.66		0.22	00.6	005.	
23.2	DBS	00020	01.25	30.378	24.35		1448.9	08.79	0.68		0.22	00.6	007.	
23.2	DBS	00030	02.45	31.428	25.11		1455.9	08.20	0.73		0.26	00.7	007.	
23.2	DBS	00040	- 0.48	31.481	25.31		1442.8	09.24	0.83		0.44	01.1	008.	

N D D C S T A T I O N D A T A

REFID	31 8286	YEAR 1971	BDTOP 00029	AIR TEMP	-02.3	DIR HGT PER		WIND-DIR 04		INST NANSEN CAST		TEN SQ 1616
CONSEC	0029	MONTH 08	SHIP GL	WET BULB	-02.8	00 0 X		WIND-SPD 03		TRACE DIR		5 SQUARE 2
LAT	70 40 N	DAY 31	DATA USE 1	BAROMETR	1018.2	SEA		WIND-FOR		DURATION		2 SQUARE 08
LONG	148 03 W	HOUR 03.9	AREA 10	CLOUD T/A	6/6	CL/TR		WEATHER	X1	ORIG WBS 035		1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
03.9	DBS	00000	- 0.20	20.431	16.41		1428.3	08.42	0.36		0.05	00.0	004.	
03.9	DBS	00005	00.18	22.525	18.09		1433.1	08.48	0.23		0.08	00.4	004.	
03.9	DBS	00010	00.24	27.293	21.92		1439.9	08.78	0.84		0.06	00.4	004.	
03.9	DBS	00015	00.92	29.499	23.66		1446.1	09.02	1.19		0.09	00.6	005.	
03.9	DBS	00020	- 0.05	30.769	24.72		1443.5	08.70	1.32		0.10	00.6	006.	
03.9	DBS	00025	- 0.68											

N D D C S T A T I O N D A T A

REFID	31 8286	YEAR 1971	BDTOP 00021	AIR TEMP	-00.1	DIR HGT PER		WIND-DIR 28		INST NANSEN CAST		TEN SQ 1616
CONSEC	0030	MONTH 08	SHIP GL	WET BULB	-00.1	00 0 X		WIND-SPD 06		TRACE DIR		5 SQUARE 2
LAT	70 37.2N	DAY 31	DATA USE 1	BAROMETR	1011.8	SEA		WIND-FOR		DURATION		2 SQUARE 08
LONG	148 11.4W	HOUR 06.1	AREA 10	CLOUD T/A	7/8	CL/TR		WEATHER	X2	ORIG WBS 036		1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
06.1	DBS	00000	- 0.28	20.815	16.72		1428.5	08.37	0.47		0.04	00.4	005.	
06.1	DBS	00005	- 0.16	21.051	16.91		1429.5	08.42	0.34		0.05	00.7	004.	
06.1	DBS	00010	00.27	27.473	22.06		1440.3	08.82	0.57		0.08	01.5	007.	
06.1	DBS	00015	- 0.26	30.151	24.23		1441.6	08.67	0.65		0.06	01.5	008.	
06.1	DBS	00020	- 0.76	30.753	24.73		1440.2	08.45	0.74		0.08	01.8	008.	

N D D C S T A T I O N D A T A

REFID	31 8286	YEAR 1971	BDTOP 00031	AIR TEMP	-01.6	DIR HGT PER		WIND-DIR 08		INST NANSEN CAST		TEN SQ 1616
CONSEC	0031	MONTH 08	SHIP GL	WET BULB	-01.7	00 0 X		WIND-SPD 04		TRACE DIR		5 SQUARE 2
LAT	70 44.9N	DAY 31	DATA USE 1	BAROMETR	1018.2	SEA		WIND-FOR		DURATION		2 SQUARE 08
LONG	148 22.0W	HOUR 10.3	AREA 10	CLOUD T/A	6/8	CL/TR		WEATHER	X7	ORIG WBS 038		1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
10.3	DBS	00000	00.19	20.867	16.76		1430.8	08.36	0.28		0.04	00.7	007.	
10.3	DBS	00005	00.34	21.275	17.09		1432.1	08.36	0.24		0.05	01.5	008.	
10.3	DBS	00010	00.23	26.146	21.00		1438.3	08.63	0.43		0.04	00.7	008.	
10.3	DBS	00015	00.35	28.797	23.12		1442.6	08.69	0.50		0.05	02.2	009.	
10.3	DBS	00020	- 0.85	31.126	25.04		1440.3	08.47	0.66		0.09	03.3	010.	
10.3	DBS	00029	- 0.90	31.203	25.10		1440.3	08.62	0.65		0.11	03.6	012.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00039	AIR TEMP -01.0	DIR HGT PER	WIND-DIR 06	INST NANSEN CAST	TEN SQ 1616
CONSEC 0032	MONTH 08	SHIP GL	WET BULB -01.5	00 0 X	WIND-SPD 04	TRACE DIR	5 SQUARE 2
LAT 70 54.3N	DAY 31	DATA USE 1	BAROMETR 1018.2	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 22.2W	HOUR 15.3	AREA 10	CLOUD T/A 6/6	CL/TR	WEATHER X2	ORIG WBS 040	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
15.3	OBS	00000	- 0.38	22.416	18.01		1430.2	08.45	0.40		0.12	12.9	006.	
15.3	OBS	00005	- 0.16	23.331	18.74		1432.5	08.53	0.52		0.10	12.9	005.	
15.3	OBS	00010	00.12	27.120	21.78		1439.1	08.91	0.37		0.14	13.0	005.	
15.3	OBS	00020	00.03	30.399	24.42		1443.4	09.17	1.20		0.12	12.9	006.	
15.3	OBS	00030	02.70	31.279	24.97		1456.7	07.85	1.24		0.12	13.1	011.	
15.3	OBS	00037	02.47	31.304	25.01		1455.9	07.76	1.42		0.15	13.1	011.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00256	AIR TEMP -01.2	DIR HGT PER	WIND-DIR 06	INST NANSEN CAST	TEN SQ 1616
CONSEC 0033	MONTH 08	SHIP GL	WET BULB -01.3	00 0 X	WIND-SPD 09	TRACE DIR	5 SQUARE 2
LAT 71 09.3N	DAY 31	DATA USE 1	BAROMETR 1018.9	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 19.0W	HOUR 20.7	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG WBS 042	1 SQUARE 18

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
20.7	OBS	00000	- 0.93	25.201	20.26		1431.4	08.73	0.10		0.11	12.9	004.	
20.7	OBS	00005	- 0.88	26.424	21.24		1433.4	09.80	0.40		0.10	12.9	009.	
20.7	OBS	00010	- 0.85	27.411	22.04		1435.0	08.98	0.44		0.09	12.9	004.	
20.7	OBS	00020	- 0.10	30.267	24.32		1442.6	09.13	0.52		0.10	12.9	006.	
20.7	OBS	00030	- 1.20	30.923	24.68		1438.5	09.11	0.71		0.10	12.9	006.	
20.7	OBS	00040	00.78					08.51	0.73		0.21	13.6	009.	
20.7	OBS	00075	- 0.74	32.316	25.99		1443.4	08.00	1.10		0.28	16.0	018.	
20.7	OBS	00100	- 0.95	32.649	26.27		1443.3	07.67	1.24		0.25	17.1	023.	
20.7	OBS	00150	- 1.27	33.05E	26.61		1443.2	07.14	1.47		0.24	18.5	029.	
20.7	OBS	00200	- 1.28											

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00090	AIR TEMP -02.0	DIR HGT PER	WIND-DIR 07	INST NANSEN CAST	TEN SQ 1616
CONSEC 0034	MONTH 09	SHIP GL	WET BULB -02.2	00 0 X	WIND-SPD 08	TRACE DIR	5 SQUARE 2
LAT 71 12 N	DAY 01	DATA USE 1	BAROMETR 1019.2	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 36 W	HOUR 02.3	AREA 10	CLOUD T/A 6/6	CL/TR	WEATHER X1	ORIG WBS 043	1 SQUARE 18

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
02.3	OBS	00000	- 0.80	25.543	20.53		1432.5	08.71	0.65		0.08	00.0	005.	
02.3	OBS	00005	- 0.82	25.563	20.55		1432.5	08.75	0.47		0.07	00.2	004.	
02.3	OBS	00010	- 0.68	26.536	21.33		1434.6	08.52	0.64		0.05	00.3	006.	
02.3	OBS	00020	01.22	30.134	24.15		1448.4	09.08	0.74		0.05	00.1	008.	
02.3	OBS	00030	02.01	31.006	24.80		1453.3	08.66	0.87		0.10	00.4	009.	
02.3	OBS	00040	01.65	31.489	25.21		1452.6	08.39	0.74		0.16	00.8	011.	
02.3	OBS	00050	01.09	31.856	25.54		1450.7	08.78	0.90		0.22	01.0	010.	
02.3	OBS	00075	- 0.73	32.375	26.04		1443.5	08.69	1.24		0.19	03.4	021.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00039	AIR TEMP -02.1	DIR HGT PER	WIND-DIR 06	INST NANSEN CAST	TEN SQ 1616
CONSEC 0035	MONTH 09	SHIP GL	WET BULB -02.2	00 0 X	WIND-SPD 07	TRACE DIR	5 SQUARE 2
LAT 70 57 N	DAY 01	DATA USE 1	BAROMETR 1019.0	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 31 W	HOUR 08.6	AREA 10	CLOUD T/A 6/6	CL/TR	WEATHER X1	ORIG WBS 045	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
08.6	OBS	00000	00.05	22.034	17.70		1431.7	08.46	0.04		0.08	TRC	004.	
08.6	OBS	00005	00.00	23.079	18.54		1433.0	08.49	0.18		0.06	00.1	004.	
08.6	OBS	00010	00.00	26.563	21.66		1438.3	08.93	1.46		0.08	00.1	005.	
08.6	OBS	00020	00.14	30.440	24.45		1443.9	09.20	1.16		0.05	TRC	006.	
08.6	OBS	00030	02.66	31.259	24.95		1456.5	07.94	1.18		0.15	00.4	010.	
08.6	OBS	00037	02.60	31.304	25.00		1456.5	07.96	1.19		0.14	00.4	011.	

N O D C S T A T I O N D A T A

REFID	31 8286	YEAR 1971	BOTOP 00033	AIR TEMP	-02.6	DIR HGT PER		WIND-DIR 07		INST NANSEN CAST		TEN SQ 1616			
CONSEC	0036	MONTH 09	SHIP GL	WET BULB	-02.7	00 0 X		WIND-SPD 11		TRACE DIR		5 SQUARE 2			
LAT	70 48.6N	DAY 01	DATA USE I	BAROMETR	1019.2	SEA		WIND-FOR		DURATION		2 SQUARE 08			
LONG	148 43.8W	HOUR 12.8	AREA 10	CLOUD T/A	6/8	CL/TR		WEATHER X2		ORIG W8S 047		1 SQUARE 08			

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
12.8	D8S	00000	- 0.79	18.196	14.61		1422.5	08.76	0.00		0.04	TRC	004.	
12.8	D8S	00005	00.09	22.188	17.82		1432.2	08.50	0.06		0.05	00.1	004.	
12.8	D8S	00010	00.42	25.795	20.71		1438.7	08.59	0.63		0.05	00.1	005.	
12.8	D8S	00015	00.64	29.130	23.38		1444.4	09.14	1.12		0.06	00.1	006.	
12.8	D8S	00020	00.77	30.696	24.63		1447.2	09.17	1.27		0.06	00.1	006.	
12.8	D8S	00031	- 0.42	31.323	25.18		1442.8	08.46	1.31		0.18	00.3	007.	

N D D C S T A T I O N D A T A

REFID	31 8286	YEAR 1971	BOTOP 00022	AIR TEMP	-03.0	DIR HGT PER		WIND-DIR 03		INST NANSEN CAST		TEN SQ 1616			
CONSEC	0037	MONTH 09	SHIP GL	WET BULB	-03.2	00 0 X		WIND-SPD 08		TRACE DIR		5 SQUARE 2			
LAT	70 43.4N	DAY 01	DATA USE 1	BAROMETR	1018.6	SEA		WIND-FOR		DURATION		2 SQUARE 08			
LONG	148 41.5W	HOUR 15.9	AREA 10	CLOUD T/A	7/7	CL/TR		WEATHER X1		ORIG W8S 048		1 SQUARE 08			

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
15.9	D8S	00000	- 0.42	20.297	16.31		1427.1	08.50	0.39		0.11	00.2	004.	
15.9	D8S	00005	- 0.01	22.687	18.22		1432.4	09.08	0.39		0.10	00.2	004.	
15.9	D8S	00010	00.29	28.271	22.70		1441.5	08.90	0.39		0.11	00.3	005.	
15.9	D8S	00015	00.06	30.368	24.39		1443.4	08.57	0.58		0.13	00.2	006.	
15.9	D8S	00020	- 0.75	30.987	24.92		1440.6		0.67		0.22	00.4	007.	

N D D C S T A T I O N D A T A

REFID	31 8286	YEAR 1971	BOTOP 00019	AIR TEMP	-02.2	DIR HGT PER		WIND-DIR 07		INST NANSEN CAST		TEN SQ 1616			
CONSEC	0038	MONTH 09	SHIP GL	WET BULB	-02.3	00 0 X		WIND-SPD 09		TRACE DIR		5 SQUARE 2			
LAT	70 36 N	DAY 01	DATA USE 1	BAROMETR	1018.5	SEA		WIND-FOR		DURATION		2 SQUARE 08			
LONG	148 50 W	HOUR 19.8	AREA 10	CLOUD T/A	6/6	CL/TR		WEATHER X1		ORIG W8S 049		1 SQUARE 08			

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
19.8	D8S	00000	- 0.39	22.622	18.18		1430.4	08.71	0.21		0.07	00.1	004.	
19.8	D8S	00003	- 0.30	25.401	20.41		1434.7	09.07	0.27		0.06	00.1	004.	
19.8	D8S	00005	- 0.24	27.040	21.73		1437.2	09.14	0.31		0.08	00.1	004.	
19.8	D8S	00010	- 0.38	30.050	24.15		1440.8	08.75	0.38		0.12	00.2	005.	
19.8	D8S	00015	- 0.64	30.626	24.63		1440.5	08.55	0.41		0.19	00.2	006.	
19.8	D8S	00017		30.657				08.43	0.39		0.26	00.3	006.	

N D D C S T A T I O N D A T A

REFID	31 8286	YEAR 1971	BOTOP 00034	AIR TEMP	-00.5	DIR HGT PER		WIND-DIR 11		INST NANSEN CAST		TEN SQ 1616			
CONSEC	0039	MONTH 09	SHIP GL	WET BULB	-01.0	00 0 X		WIND-SPD 16		TRACE DIR		5 SQUARE 2			
LAT	70 49.5N	DAY 02	DATA USE 1	BAROMETR	1006.8	SEA		WIND-FOR		DURATION		2 SQUARE 08			
LONG	148 50 W	HOUR 23.2	AREA 10	CLOUD T/A	7/8	CL/TR		WEATHER X2		ORIG W8S 051		1 SQUARE 08			

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
23.2	D8S	00000	- 0.45					09.00			0.02	00.0		
23.2	D8S	00005	- 0.44	25.370	20.39		1434.0	08.91			0.00	00.0		
23.2	D8S	00010	00.00	27.431	22.04		1439.0	09.03			0.05	00.3		
23.2	D8S	00015	01.30	30.239	24.23		1448.9	08.94			0.00	00.7		
23.2	D8S	00020	01.41	31.200	24.99		1450.8	08.24			0.06	01.0		
23.2	D8S	00025	01.36	31.199	25.00		1450.6	08.28			0.17	01.3		
23.2	D8S	00030	01.34	31.211	25.01		1450.6	08.28			0.17	01.7		

N O O C S T A T I O N D A T A

REFID	31 8286	YEAR 1971	BOTOP 00033	AIR TEMP -01.2	DIR HGT PER	WIND-DIR 05	INST NANSEN CAST	TEN SQ 1616
CONSEC	0040	MONTH 09	SHIP GL	WET BULB -01.3	00 0 X	WIND-SPD 16	TRACE DIR	5 SQUARE 2
LAT	71 00.0N	DAY 03	DATA USE 1	BAROMETR 1003.1	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG	148 50.7W	HOUR 14.6	AREA 10	CLOUD T/A 7/7	CL/TR	WEATHER X1	ORIG WBS 053	1 SQUARE 18

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
14.6	OBS	00000	- 0.67					08.67	0.09		0.14	00.1	004.	
14.6	OBS	00005	- 0.70	22.244	17.87		1428.5	09.91	0.00		0.13	00.1	005.	
14.6	OBS	00010	- 0.65	26.389	21.21		1434.5	09.12	0.43		0.12	00.1	005.	
14.6	OBS	00020	00.38	29.954	24.05		1444.4	09.38	0.84		0.04	TRC	005.	
14.6	OBS	00030	01.90	31.389	25.11		1453.4	08.20	0.86		0.24	00.3	010.	

N O O C S T A T I O N D A T A

REFID	31 8286	YEAR 1971	BOTOP 00166	AIR TEMP -01.2	DIR HGT PER	WIND-DIR 05	INST NANSEN CAST	TEN SQ 1616
CONSEC	0041	MONTH 09	SHIP GL	WET BULB -01.2	00 0 X	WIND-SPD 13	TRACE DIR	5 SQUARE 2
LAT	71 12 N	DAY 03	DATA USE 1	BAROMETR 1002.7	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG	148 43.9W	HOUR 19.9	AREA 10	CLOUD T/A	CL/TR	WEATHER X7	ORIG WBS 055	1 SQUARE 18

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
19.9	OBS	00000		20.082				08.75	0.11		0.09	00.0	004.	
19.9	OBS	00005		20.320				08.67	0.00		0.09	00.1	005.	
19.9	OBS	00010		24.295				08.87	0.30		0.11	00.1	005.	
19.9	OBS	00015		28.769				08.87	0.59		0.11	00.1	005.	
19.9	OBS	00020		30.027				08.50	0.60		0.12	00.1	007.	
19.9	OBS	00030		30.848				08.56	0.57		0.16	00.2	007.	
19.9	OBS	00050		31.518				08.49	0.73		0.42	01.2	008.	
19.9	OBS	00070		32.180				07.95	1.26		0.14	03.7	016.	
19.9	OBS	00100		32.960				07.05	1.56		0.39	06.4	022.	
19.9	OBS	00120		33.543				06.39	1.66		0.24	07.7	033.	

N O O C S T A T I O N D A T A

REFID	31 8286	YEAR 1971	BOTOP 01829	AIR TEMP 00.0	DIR HGT PER	WIND-DIR 17	INST STO RECORDER	TEN SQ 1616
CONSEC	0042	MONTH 09	SHIP GL	WET BULB 00.0	00 0 X	WIND-SPD 01	TRACE DIR D	5 SQUARE 2
LAT	71 20.2N	DAY 04	DATA USE 1	BAROMETR 1000.8	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG	149 07.1W	HOUR 08.6	AREA 10	CLOUD T/A	CL/TR	WEATHER X7	ORIG WBS 057	1 SQUARE 19

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
08.6	OBS	00000						09.06	0.45		0.11	00.3	002.	
	OBS	00008	- 0.36											
	OBS	00010	00.50											
	OBS	00014	02.67	30.42	24.29		1455.2							
	OBS	00020	- 1.25	30.46	24.51		1437.5							
	OBS	00025	01.38	30.78	24.66		1450.1							
	OBS	00033	01.69	31.34	25.09		1452.4							
	OBS	00036	00.05	31.36	25.19		1445.1							
	OBS	00039	01.04	31.86	25.54		1450.3	08.69	0.84		0.16	07.3	012.	
	OBS	00045	- 1.28	31.84	25.63		1439.7							
	OBS	00050	- 1.06	32.13	25.85		1441.2							
	OBS	00059	- 0.97	32.42	26.09		1442.2							
	OBS	00066	- 1.47	32.51	26.17		1440.1							
	OBS	00075	- 1.50	32.66	26.29		1440.3							
	OBS	00089	- 1.17	32.88	26.46		1442.4							
	OBS	00098	- 1.45	32.90	26.49		1441.2							
	OBS	00100	- 1.35	32.99	26.56		1441.9							
	OBS	00125	- 1.43	33.19	26.72		1442.2							
	OBS	00150	- 1.41	33.41	26.90		1443.0							
	OBS	00185	- 1.39	33.84	27.25		1444.3							
	OBS	00200	- 1.10	34.06	27.42		1446.2							
	OBS	00250	- 0.12	34.66	27.86		1452.4	07.39	0.62		0.17	00.3	010.	
	OBS	00252	- 0.10	34.66	27.86		1452.5							
	OBS	00300	00.25	34.88	28.02		1455.2							
	OBS	00400	00.41	34.96	28.07		1457.7							
	OBS	00500	00.38	34.98	28.09		1459.3	06.84	1.57		0.14	09.6	019.	
	OBS	00600	00.30	35.00	28.11		1460.6							
	OBS	00700	00.15	35.01	28.13		1461.6							
	OBS	00745	00.10	35.01	28.13		1462.2	06.90	0.91		0.06	08.2	013.	
	OBS	00800	00.03	35.01	28.13		1462.8							
	OBS	00900	- 0.06	35.02	28.15		1464.0							
	OBS	01000	- 0.13	35.02	28.15		1465.4		0.87		0.09	07.5	012.	
	OBS	01100	- 0.20	35.02	28.15		1466.8							
	OBS	01200	- 0.24	35.03	28.16		1468.3							
	OBS	01250	- 0.26	35.03	28.16		1469.0	06.86	0.85		0.07	07.4	012.	
	OBS	01300	- 0.28	35.04	28.17		1469.8							
	OBS	01400	- 0.31	35.04	28.17		1471.4							
	OBS	01485	- 0.34	35.05	28.18		1472.7	06.88	0.83		0.08	07.1	012.	
	OBS	01500	- 0.35	35.05	28.18		1472.9							

N O O C S T A T I O N D A T A

REFIO	31 8286	YEAR 1971	BOTOP 01829	AIR TEMP	-01.1	DIR HGT PER		WIND-DIR 06		INST NANSEN CAST		TEN SQ 1616
CONSEC	0043	MONTH 09	SHIP GL	WET BULB	-01.1	00 0 X		WIND-SPD 14		TRACE DIR		5 SQUARE 2
LAT	71 23.4N	DAY 05	DATA USE 1	BAROMETR	0999.8	SEA		WIND-FOR		DURATION		2 SQUARE 08
LONG	149 39.0W	HOUR 19.5	AREA 10	CLOUD T/A	7/8	CL/TR		WEATHER	X2	ORIG W8S 057		1 SQUARE 19

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
19.5	O8S	00000	01.00					08.59			0.06	00.0		
19.5	O8S	00010	00.72					09.02			0.09	01.6		
19.5	O8S	00015	01.74	27.041	21.65		1446.5	08.61			0.08	01.3		
19.5	O8S	00020	- 0.59	29.444	23.67		1439.2	09.32			0.06	01.8		
19.5	O8S	00025	- 0.85	30.265	24.34		1439.2	09.31			0.08	01.3		
19.5	O8S	00030	- 0.35	30.622	24.61		1442.1	08.88			0.24	03.7		
19.5	O8S	00035	- 0.03	31.051	24.95		1444.2	08.68			0.45	06.6		
19.5	O8S	00050	- 0.51	31.362	25.22		1442.7	08.36			0.22	05.3		
19.5	O8S	00075	- 1.17	32.104	25.84		1441.1	07.49			0.30	11.5		
19.5	O8S	00100	- 1.12	32.649	26.27		1442.5	07.63			0.39	12.9		

N O O C S T A T I O N D A T A

REFIO	31 8286	YEAR 1971	BOTOP 00558	AIR TEMP	-01.0	DIR HGT PER		WIND-DIR 04		INST STO RECORDER		TEN SQ 1616
CONSEC	0044	MONTH 09	SHIP GL	WET BULB	-01.1	00 0 X		WIND-SPD 11		TRACE DIR	0	5 SQUARE 2
LAT	71 14.4N	DAY 05	DATA USE 1	BAROMETR	1004.1	SEA		WIND-FOR		DURATION		2 SQUARE 08
LONG	149 25.9W	HOUR 21.2	AREA 10	CLOUD T/A		CL/TR		WEATHER	X7	ORIG W8S 058		1 SQUARE 19

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
21.2	O8S	00000						09.76	0.42		0.12	02.2	004.	
	O8S	00010						08.78	0.63		0.09	01.8	005.	
	O8S	00012	- 0.83											
	O8S	00015	- 0.79					09.22	0.61		0.06	01.1	006.	
	O8S	00020	- 0.88					09.33	0.68		0.04	00.4	007.	
	O8S	00025	- 1.04	30.76	24.75		1439.0							
	O8S	00030	- 0.82	30.97	24.91		1440.4	09.31	0.66		0.12	01.8	010.	
	O8S	00033	- 0.92	31.09	25.01		1440.1							
	O8S	00040	00.52	31.18	25.03		1447.0							
	O8S	00043	01.40	31.60	25.32		1451.6							
	O8S	00048	00.64	31.68	25.42		1448.4							
	O8S	00050	00.55	31.77	25.50		1448.1							
	O8S	00054	00.47	31.87	25.58		1448.0							
	O8S	00062	- 1.15	32.70	26.32		1441.8							
	O8S	00068	- 1.30	33.13	26.67		1441.8							
	O8S	00075	- 1.34	33.38	26.87		1442.0	07.78	1.53		0.20	11.0	040.	
	O8S	00100	- 1.35	33.43	26.91		1442.5							
	O8S	00104	- 1.34	33.46	26.94		1442.6							
	O8S	00125	- 1.13	33.96	27.34		1444.7							
	O8S	00140	- 0.60	34.37	27.65		1448.0							
	O8S	00150	- 0.42	34.50	27.74		1449.1							
	O8S	00176	- 0.05	34.72	27.90		1451.6							
	O8S	00200	00.09	34.80	27.96		1452.7	06.08	1.07		0.23	11.4	020.	
	O8S	00204	00.13	34.82	27.97		1453.0							
	O8S	00250	00.30	34.89	28.02		1454.6							
	O8S	00300	00.35	34.93	28.05		1455.8							
	O8S	00350	00.39	34.95	28.06		1456.8							
	O8S	00400	00.38	34.96	28.07		1457.6	06.42	0.88		0.19	09.5	015.	
	O8S	00500	00.38	34.96	28.07		1459.3	06.52	0.81		0.17	09.2	015.	

N O O C S T A T I O N D A T A

REFIO	31 8286	YEAR 1971	BOTOP 00192	AIR TEMP	-01.0	DIR HGT PER		WIND-DIR 04		INST NANSEN CAST		TEN SQ 1616
CONSEC	0045	MONTH 09	SHIP GL	WET BULB	-01.1	00 0 X		WIND-SPD 11		TRACE DIR		5 SQUARE 2
LAT	71 11.9N	DAY 06	DATA USE 1	BAROMETR	1004.1	SEA		WIND-FOR		DURATION		2 SQUARE 08
LONG	149 31.1W	HOUR 02.8	AREA 10	CLOUD T/A	7/7	CL/TR		WEATHER	X7	ORIG W8S 059		1 SQUARE 19

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
02.8	O8S	00000	- 0.91	20.714	16.64		1425.3	08.71	0.14		0.21	03.1	004.	
02.8	O8S	00005	- 0.91	20.833	16.74		1425.6	08.71	0.11		0.21	03.3	003.	
02.8	O8S	00010	- 0.48	24.260	19.50		1432.4	08.90	0.23		0.22	03.1	003.	
02.8	O8S	00015	- 0.33	27.561	22.15		1437.7	09.07	0.46		0.20	02.4	003.	
02.8	O8S	00020	- 0.88	28.263	22.73		1436.2	09.41	0.58		0.20	02.2	002.	
02.8	O8S	00030	01.38	30.671	24.57		1450.1	08.87	0.61		0.16	01.3	005.	
02.8	O8S	00040	02.47	31.296	25.00		1455.9	08.16	0.58		0.33	04.4	007.	
02.8	O8S	00050	01.80	31.659	25.34		1453.6	07.98	0.99		0.33	04.6	013.	
02.8	O8S	00075	- 1.31	33.214	26.74		1442.0	07.90	1.80		0.36	08.9	030.	
02.8	O8S	00100	- 1.27	33.664	27.10		1443.2	06.23	1.92		0.31	09.5	033.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BDTDP 00034	AIR TEMP -00.8	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1616
CONSEC 0046	MONTH 09	SHIP GL	WET BULB -01.1	00 0 X	WIND-SPD 09	TRACE DIR	5 SQUARE 2
LAT 70 55.2N	DAY 06	DATA USE 1	BAROMETR 1006.6	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 57.0W	HOUR 17.2	AREA 10	CLOUD T/A 7/8	CL/TR	WEATHER X2	DRIG W8S 062	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TDT P	NO2	NO3	SIO3	PH
17.2	D8S	00000	- 0.62	22.364	17.97		1429.0		0.55		0.04	TRC	005.	
17.2	D8S	00005	- 0.58	22.439	18.03		1429.3		0.62		0.09	TRC	005.	
17.2	D8S	00010	- 0.47	26.652	21.42		1435.7		0.83		0.07	TRC	003.	
17.2	D8S	00020	00.77	30.810	24.72		1447.3		0.73		0.04	TRC	005.	
17.2	D8S	00030	01.10	31.483	25.24		1449.9		0.80		0.17	00.3	009.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BDTDP 00024	AIR TEMP -00.5	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1616
CONSEC 0047	MONTH 09	SHIP GL	WET BULB -01.1	00 0 X	WIND-SPD 09	TRACE DIR	5 SQUARE 2
LAT 70 43 N	DAY 06	DATA USE 1	BAROMETR 1007.6	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 149 00 W	HOUR 21.5	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	DRIG W8S 063	1 SQUARE 09

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TDT P	NO2	NO3	SIO3	PH
21.5	D8S	00000	- 0.72	28.480	22.90		1436.9	08.32	1.01		0.07	TRC	005.	
21.5	D8S	00005	- 0.91	29.559	23.77		1437.6	08.71	1.10		0.08	00.3	005.	
21.5	D8S	00010	- 1.06	30.361	24.42		1438.1	08.37	1.35		0.10	00.4	007.	
21.5	D8S	00015	- 0.92	31.260	25.15		1440.1	08.40	1.54		0.10	00.2	009.	
21.5	D8S	00020	- 1.02	31.273	25.16		1439.7	08.35	1.56		0.12	00.3	009.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BDTDP 00022	AIR TEMP -00.4	DIR HGT PER	WIND-DIR 06	INST NANSEN CAST	TEN SQ 1616
CONSEC 0048	MONTH 09	SHIP GL	WET BULB -01.4	00 0 X	WIND-SPD 11	TRACE DIR	5 SQUARE 2
LAT 70 39 N	DAY 07	DATA USE 1	BAROMETR 1008.7	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 21 W	HOUR 21.0	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	DRIG W8S 067	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TDT P	NO2	NO3	SIO3	PH
21.0	D8S	00000	- 0.32	28.260	22.71		1438.5	08.48	0.59		0.07	00.1	005.	
21.0	D8S	00005	- 0.81	29.419	23.66		1437.9	08.98	0.60		0.10	00.1	005.	
21.0	D8S	00010	- 1.30	30.612	24.63		1437.3	09.25	0.69		0.14	00.2	005.	
21.0	D8S	00015	- 1.23	31.109	25.03		1438.4	08.42	0.94		0.17	00.9	001.	
21.0	D8S	00020	- 1.11	31.520	25.36		1439.6	07.88	0.98		0.22	01.1	013.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BDTDP 00022	AIR TEMP -00.4	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1616
CONSEC 0049	MONTH 09	SHIP GL	WET BULB -01.4	00 0 X	WIND-SPD 07	TRACE DIR	5 SQUARE 2
LAT 70 39 N	DAY 07	DATA USE 1	BAROMETR 1008.7	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 21 W	HOUR 23.0	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X0	DRIG W8S 067	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TDT P	NO2	NO3	SIO3	PH
23.0	D8S	00000	- 0.28	28.297	22.74		1438.7	08.51	0.62		0.15	00.2	004.	
23.0	D8S	00005	- 0.71	29.061	23.37		1437.8	08.64	0.68		0.09	00.2	005.	
23.0	D8S	00010	- 1.18	30.549	24.58		1437.8	09.04	0.70		0.21	00.6	005.	
23.0	D8S	00015	- 1.23	31.296	25.18		1438.7	08.24	0.92		0.15	01.5	010.	
23.0	D8S	00020	- 1.11	31.520	25.36		1439.6	07.83	0.99		0.21	01.6	011.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00023	AIR TEMP -00.4	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1616
CONSEC 0050	MONTH 09	SHIP GL	WET BULB -01.4	00 0 X	WIND-SPD 07	TRACE DIR	5 SQUARE 2
LAT 70 39 N	DAY 08	DATA USE 1	BAROMETR 1008.7	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 21 W	HOUR 01.0	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG WBS 067	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
01.0	OBS	00000	- 0.45	28.479	22.89		1438.2	08.45	0.57		0.09	00.2	004.	
01.0	OBS	00005	- 0.56	28.851	23.19		1438.2	08.56	0.59		0.09	00.2	004.	
01.0	OBS	00010	- 1.24	30.703	24.70		1437.7	08.95	0.68		0.09	00.4	005.	
01.0	OBS	00015	- 1.18	31.435	25.30		1439.1	07.94	0.90		0.13	01.6	010.	
01.0	OBS	00020	- 1.13	31.512	25.36		1439.5	07.88	1.13		0.29	01.8	011.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00023	AIR TEMP -00.5	DIR HGT PER	WIND-DIR 05	INST NANSEN CAST	TEN SQ 1616
CONSEC 0051	MONTH 09	SHIP GL	WET BULB -01.1	00 0 X	WIND-SPD 08	TRACE DIR	5 SQUARE 2
LAT 70 39 N	DAY 08	DATA USE 1	BAROMETR 1008.7	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 21 W	HOUR 03.0	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X1	ORIG WBS 067	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
03.0	OBS	00000	- 0.69	29.119	23.41		1437.9	08.48	0.57		0.15	00.3	004.	
03.0	OBS	00005	- 0.72	29.146	23.44		1437.9	08.54	0.57		0.10	00.2	004.	
03.0	OBS	00010	- 1.24	30.519	24.56		1437.4	08.83	0.70		0.27	00.6	005.	
03.0	OBS	00015	- 1.15	31.492	25.34		1439.3	07.78	1.01		0.30	01.8	010.	
03.0	OBS	00020	- 1.15	32.532	26.18		1440.8	07.81	0.99		0.23	01.7	011.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00023	AIR TEMP -00.5	DIR HGT PER	WIND-DIR 20	INST NANSEN CAST	TEN SQ 1616
CONSEC 0052	MONTH 09	SHIP GL	WET BULB -01.1	07 4 2	WIND-SPD 10	TRACE DIR	5 SQUARE 2
LAT 70 39 N	DAY 08	DATA USE 1	BAROMETR 1008.7	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 21 W	HOUR 05.3	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X1	ORIG WBS 067	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
05.3	OBS	00000	- 0.62	28.986	23.30		1438.1	08.76	0.77		0.14	00.2	004.	
05.3	OBS	00005	- 0.67	29.206	23.48		1438.2	08.71	0.59		0.13	00.2	004.	
05.3	OBS	00010	- 1.13	30.418	24.47		1437.8	08.96	0.68		0.13	00.3	005.	
05.3	OBS	00015	- 1.18	31.475	25.33		1439.1	08.07	0.99		0.16	01.6	011.	
05.3	OBS	00020	- 1.16	32.516	26.17		1440.8	07.85	0.97		0.15	01.6	011.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00025	AIR TEMP -00.5	DIR HGT PER	WIND-DIR 34	INST NANSEN CAST	TEN SQ 1616
CONSEC 0053	MONTH 09	SHIP GL	WET BULB -00.8	00 0 X	WIND-SPD 04	TRACE DIR	5 SQUARE 2
LAT 70 41 N	DAY 08	DATA USE 1	BAROMETR 1009.4	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 25 W	HOUR 16.0	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG WBS 069	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
16.0	OBS	00000	- 0.25	28.089	22.57		1438.6	08.45	0.40		0.09	00.1	005.	
16.0	OBS	00005	- 0.54	28.795	23.15		1438.3	08.80	0.38		0.09	00.1	006.	
16.0	OBS	00010	- 0.89	29.435	23.67		1437.6	08.98	0.49		0.07	00.1	005.	
16.0	OBS	00015	- 1.31	29.480	23.72		1435.7	09.48	0.54		0.07	00.2	005.	
16.0	OBS	00023	- 0.55	32.566	26.19		1443.7	08.21	0.80		0.17	00.7	011.	

N O O C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00025	AIR TEMP -00.1	DIR HGT PER	WIND-DIR 35	INST NANSEN CAST	TEN SQ 1616
CONSEC 0054	MONTH 09	SHIP GL	WET BULB -00.3	00 0 X	WIND-SPD 03	TRACE DIR	5 SQUARE 2
LAT 70 41 N	DAY 08	DATA USE 1	BAROMETR 1009.7	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 25 W	HOUR 19.0	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X8	DRIG W8S 069	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
19.0	OBS	00000	- 0.32	28.411	22.83		1438.7	08.65	0.38		0.04	TRC	004.	
19.0	OBS	00005	- 0.37	28.450	22.87		1438.6	08.60	0.33		0.11	00.1	006.	
19.0	OBS	00010	- 0.86	29.721	23.90		1438.1	09.02	0.55		0.13	00.2	006.	
19.0	OBS	00015	01.28	30.403	24.36		1437.0	09.40	0.58		0.11	00.2	005.	
19.0	OBS	00020	- 0.50	31.547	25.37		1442.5	08.06	0.77		0.22	00.9	012.	

N O O C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00025	AIR TEMP -00.1	DIR HGT PER	WIND-DIR 35	INST NANSEN CAST	TEN SQ 1616
CONSEC 0055	MONTH 09	SHIP GL	WET BULB -00.3	00 0 X	WIND-SPD 03	TRACE DIR	5 SQUARE 2
LAT 70 41 N	DAY 08	DATA USE 1	BAROMETR 1009.7	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 25 W	HOUR 20.0	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	DRIG W8S 069	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
20.0	OBS	00000	- 0.25	28.175	22.64		1438.7	08.50	0.47		0.18	00.1	004.	
20.0	OBS	00005	- 0.36	28.505	22.91		1438.7	08.60	0.58		0.18	00.2	006.	
20.0	OBS	00010	- 0.88	29.740	23.92		1438.1	09.11	0.46		0.25	00.3	003.	
20.0	OBS	00015	- 1.26	30.393	24.45		1437.3	09.39	0.53		0.13	00.1	002.	
20.0	OBS	00020	- 0.50	31.546	25.36		1442.5	08.15	0.79		0.36	01.0	008.	

N D O C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00025	AIR TEMP -00.1	DIR HGT PER	WIND-DIR 35	INST NANSEN CAST	TEN SQ 1616
CONSEC 0056	MONTH 09	SHIP GL	WET BULB -00.3	00 0 X	WIND-SPD 03	TRACE DIR	5 SQUARE 2
LAT 70 41 N	DAY 08	DATA USE 1	BAROMETR 1009.7	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 25 W	HOUR 22.0	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	DRIG W8S 069	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
22.0	OBS	00000	- 0.15	28.097	22.58		1439.0	08.33	0.37		0.18	00.2	003.	
22.0	OBS	00005	- 0.41	28.436	22.86		1438.4	08.73	0.46		0.25	00.1	003.	
22.0	OBS	00010	- 1.09	30.055	24.18		1437.5	08.75	0.50		0.36	00.2	004.	
22.0	OBS	00015	- 1.27	30.404	24.46		1437.2	09.41	0.53		0.22	00.1	002.	
22.0	OBS	00020	- 0.48	31.528	25.35		1442.6	08.15	0.82		0.45	01.0	009.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00025	AIR TEMP -00.5	DIR HGT PER	WIND-DIR 35	INST NANSEN CAST	TEN SQ 1616
CONSEC 0057	MONTH 09	SHIP GL	WET BULB -00.6	00 0 X	WIND-SPD 03	TRACE DIR	5 SQUARE 2
LAT 70 41 N	DAY 08	DATA USE 1	BAROMETR 1009.0	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 25 W	HOUR 23.9	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	DRIG W8S 069	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
23.9	OBS	00000	- 0.19	28.196	22.66		1439.0	08.45	0.33		0.19	00.3	003.	
23.9	OBS	00005	- 0.26	28.280	22.73		1438.9	08.46	0.29		0.24	00.4	003.	
23.9	OBS	00010	- 0.76	29.278	23.54		1438.0	08.78	0.45		0.24	00.6	003.	
23.9	OBS	00015	- 1.28	30.496	24.54		1437.3	09.47	0.56		0.28	00.6	003.	
23.9	OBS	00020	- 0.49	31.556	25.37		1442.6	08.13	0.75		0.29	00.9	008.	

N O O C S T A T I O N D A T A

REFID	31	8286	YEAR 1971	BOTOP 00025	AIR TEMP	00.4	OIR HGT PER		WIND-OIR 35	INST NANSEN CAST	TEN SQ 1616
CONSEC		0058	MONTH 09	SHIP GL	WET BULB	-00.5	00 0 X		WIND-SPD 02	TRACE OIR	5 SQUARE 2
LAT	70 41	N	DAY 09	DATA USE 1	BAROMETR	1009.4	SEA		WIND-FOR	DURATION	2 SQUARE 08
LONG	148 25	W	HOUR 02.0	AREA 10	CLOUD T/A	6/8	CL/TR		WEATHER X2	ORIG WBS 069	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
02.0	OBS	00000	00.15	27.611	22.18		1439.8	08.35	0.41		0.16	00.4	004.	
02.0	OBS	00005	- 0.18	28.120	22.60		1439.0	08.37	0.40		0.18	00.5	004.	
02.0	OBS	00010	- 0.76	28.931	23.26		1437.5	08.75	0.48		0.08	00.1	003.	
02.0	OBS	00015	- 1.14	30.665	24.67		1438.2	08.80	0.56		0.21	00.6	003.	
02.0	OBS	00020	- 0.49	31.538	25.36		1442.5	08.19	0.88		0.23	00.7	006.	

N O O C S T A T I O N D A T A

REFID	31	8286	YEAR 1971	BOTOP 00025	AIR TEMP	00.4	OIR HGT PER		WIND-OIR 35	INST NANSEN CAST	TEN SQ 1616
CONSEC		0059	MONTH 09	SHIP GL	WET BULB	-00.5	00 0 X		WIND-SPO 02	TRACE OIR	5 SQUARE 2
LAT	70 41	N	DAY 09	DATA USE 1	BAROMETR	1009.4	SEA		WIND-FOR	DURATION	2 SQUARE 08
LONG	148 25	W	HOUR 04.0	AREA 10	CLOUD T/A	6/8	CL/TR		WEATHER X2	ORIG WBS 069	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
04.0	OBS	00000	00.25	26.876	21.58		1439.2	08.35	0.40		0.15	00.3	003.	
04.0	OBS	00005	- 0.14	28.134	22.61		1439.2	08.73	0.41		0.12	00.1	003.	
04.0	OBS	00010	- 0.73	28.836	23.19		1437.5	08.60	0.41		0.23	00.7	003.	
04.0	OBS	00015	- 1.19	30.623	24.64		1437.9	08.71	0.59		0.17	00.6	004.	
04.0	OBS	00020	- 0.58	31.541	25.36		1442.1	08.09	0.83		0.42	01.7	007.	

N O O C S T A T I O N D A T A

REFID	31	8286	YEAR 1971	BOTOP 00020	AIR TEMP	-01.7	OIR HGT PER		WIND-OIR 29	INST NANSEN CAST	TEN SQ 1617
CONSEC		0060	MONTH 09	SHIP GL	WET BULB	-01.5	00 0 X		WIND-SPO 06	TRACE OIR	5 SQUARE 1
LAT	71 04	N	DAY 10	DATA USE 1	BAROMETR	1010.0	SEA		WIND-FOR	DURATION	2 SQUARE 00
LONG	151 22	W	HOUR 01.3	AREA 10	CLOUD T/A	6/7	CL/TR		WEATHER X7	ORIG WBS 071	1 SQUARE 11

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
01.3	OBS	00000	- 0.70	25.436	20.45		1432.8	08.51			0.04	TRC		
01.3	OBS	00005	- 0.62	27.151	21.63		1435.6	08.53			0.28	00.6		
01.3	OBS	00010	- 0.04	28.545	22.93		1440.3	08.44			0.15	00.3		
01.3	OBS	00015	02.12	30.144	24.11		1452.4	08.23			0.21	00.5		
01.3	OBS	00018	02.22	30.268	24.20		1453.1	08.22			0.32	00.7		

N O O C S T A T I O N D A T A

REFID	31	8286	YEAR 1971	BOTOP 00047	AIR TEMP	-00.5	OIR HGT PER		WIND-OIR 25	INST NANSEN CAST	TEN SQ 1617
CONSEC		0061	MONTH 09	SHIP GL	WET BULB	-00.5	00 0 X		WIND-SPO 03	TRACE OIR	5 SQUARE 1
LAT	71 11	N	DAY 10	DATA USE 1	BAROMETR	1009.7	SEA		WIND-FOR	DURATION	2 SQUARE 00
LONG	151 13.6	W	HOUR 07.3	AREA 10	CLOUD T/A	7/8	CL/TR		WEATHER X7	ORIG WBS 072	1 SQUARE 11

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
07.3	OBS	00000	- 0.83	22.758	18.29		1428.5	08.60	0.53		0.04	00.4	005.	
07.3	OBS	00005	- 0.50	25.950	20.86		1434.5	08.69	0.54		0.04	00.5	004.	
07.3	OBS	00010	00.27	28.099	22.56		1441.2	08.50	0.56		0.06	00.8	004.	
07.3	OBS	00020	02.56	30.406	24.28		1454.8	08.01	0.57		0.06	00.8	004.	
07.3	OBS	00030	02.39	31.057	24.81		1455.1	07.90	0.71		0.10	01.1	005.	
07.3	OBS	00045	- 0.88	32.569	26.20		1442.6	08.69	1.47		0.15	06.7	017.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00071	AIR TEMP -00.7	DIR HGT PER	WIND-DIR 28	INST NANSEN CAST	TEN SQ 1617
CONSEC 0062	MONTH 09	SHIP GL	WET BULB -00.8	00 0 X	WIND-SPD 03	TRACE DIR	5 SQUARE 1
LAT 71 19.3N	DAY 10	DATA USE 1	BAROMETR 1009.0	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 151 17.7W	HOUR 12.1	AREA 10	CLOUD T/A 7/8	CL/TR	WEATHER X7	ORIG W8S 073	1 SQUARE 11

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
12.1	OBS	00000	- 0.98	21.463	17.24		1426.0	08.69	0.23		0.02	00.2	004.	
12.1	OBS	00010	- 0.80	26.136	21.01		1433.4	08.44	0.37		0.01	00.2	002.	
12.1	OBS	00020	01.91	30.596	24.48		1452.2	08.60	0.44		0.01	00.3	003.	
12.1	OBS	00025	00.44	31.410	25.22		1446.7	09.10	0.58		0.02	00.5	006.	
12.1	OBS	00030	00.31					09.09	0.72		0.03	00.8	004.	
12.1	OBS	00040	- 0.75	32.599	26.22		1443.1	08.37	1.15		0.06	02.9	012.	
12.1	OBS	00050	- 1.04						1.41		0.08	05.6	019.	
12.1	OBS	00068	- 1.15	32.769	26.37		1442.0	07.44	1.54		0.11	07.8	012.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00098	AIR TEMP -00.9	DIR HGT PER	WIND-DIR 25	INST NANSEN CAST	TEN SQ 1617
CONSEC 0063	MONTH 09	SHIP GL	WET BULB -00.9	00 0 X	WIND-SPD 04	TRACE DIR	5 SQUARE 1
LAT 71 20 N	DAY 10	DATA USE 1	BAROMETR 1008.2	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 151 13 W	HOUR 14.6	AREA 10	CLOUD T/A 7/8	CL/TR	WEATHER X2	ORIG W8S 074	1 SQUARE 11

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
14.6	OBS	00000	- 0.98	21.614	17.36		1426.2	08.82	0.50		0.09	00.8		
14.6	OBS	00010	00.69					08.50	0.60		0.11	00.5		
14.6	OBS	00015	00.69	26.330	21.13		1440.8	08.56	0.73		0.14	00.9		
14.6	OBS	00020	01.62	30.266	24.23		1450.4	08.86	0.91		0.13	00.3		
14.6	OBS	00030	00.34	31.530	25.32		1446.5	09.39	0.99		0.20	01.4		
14.6	OBS	00040	- 0.63	32.138	25.85		1443.1	08.43	1.00		0.30	04.9		
14.6	OBS	00065	- 1.18	32.816	26.41		1441.8	07.52	1.26		0.34	09.3		
14.6	OBS	00085	- 1.33	33.030	26.59		1441.8	07.06	1.57		0.37	10.9		

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00095	AIR TEMP -00.5	DIR HGT PER	WIND-DIR 25	INST NANSEN CAST	TEN SQ 1617
CONSEC 0064	MONTH 09	SHIP GL	WET BULB -00.5	00 0 X	WIND-SPD 11	TRACE DIR	5 SQUARE I
LAT 71 14.8N	DAY 10	DATA USE 1	BAROMETR 1007.8	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 27.6W	HOUR 21.2	AREA 10	CLOUD T/A 7/8	CL/TR	WEATHER X2	ORIG W8S 075	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
21.2	OBS	00000	- 0.79	19.420	15.60		1424.2	08.79	0.06		0.28	00.2	005.	
21.2	OBS	00010	- 0.92	27.159	21.84		1434.3	09.24	0.42		0.29	00.2	003.	
21.2	OBS	00020	- 1.27	30.177	24.28		1437.0	09.54	0.50		0.30	00.3	004.	
21.2	OBS	00030	- 1.26	30.943	24.90		1438.3	09.09	0.51		0.40	00.7	008.	
21.2	OBS	00035	01.01	31.298	25.10		1449.3	08.46	0.58		0.53	01.0	009.	
21.2	OBS	00040	00.92	31.782	25.49		1449.7	08.13	0.76		0.55	02.2	015.	
21.2	OBS	00050	- 1.14	32.712	26.33		1441.6	07.40	1.00		0.57	08.6	028.	
21.2	OBS	00070	- 1.25	32.844	26.44		1441.6	07.19	1.43		0.56	09.6	031.	
21.2	OBS	00090	- 1.23	32.858	26.45		1442.1	07.29	1.61		0.61	09.4	030.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00028	AIR TEMP -00.6	DIR HGT PER	WIND-DIR 26	INST NANSEN CAST	TEN SQ 1617
CONSEC 0065	MONTH 09	SHIP GL	WET BULB -00.6	00 0 X	WIND-SPD 04	TRACE DIR	5 SQUARE 1
LAT 71 04.7N	DAY 11	DATA USE 1	BAROMETR 1006.8	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 27.6W	HOUR 05.7	AREA 10	CLOUD T/A 7/8	CL/TR	WEATHER X7	ORIG W8S 077	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
05.7	OBS	00000	- 0.59	22.332	17.94		1429.1	08.60	0.44		0.07	00.0	007.	
05.7	OBS	00005	- 0.48	24.475	19.67		1432.6	08.72	0.41		0.07	TRC	007.	
05.7	OBS	00010	- 0.50	26.860	21.59		1435.9	08.95	0.48		0.24	TRC	006.	
05.7	OBS	00015	- 0.50	28.292	22.74		1437.9	09.00	0.55		0.65	TRC	006.	
05.7	OBS	00020	02.43	30.582	24.43		1454.5	08.17	0.70		0.69	00.1	010.	
05.7	OBS	00025	01.71	31.478	25.20		1452.6	07.77	1.06		0.64	01.8	018.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00026	AIR TEMP -01.3	DIR HGT PER	WIND-DIR 35	INST NANSEN CAST	TEN SQ 1616
CONSEC 0066	MONTH 09	SHIP GL	WET BULB -01.7	00 0 X	WIND-SPD 05	TRACE DIR	5 SQUARE 2
LAT 70 58.4N	DAY 11	DATA USE 1	BAROMETR 1007.2	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 149 59.1W	HOUR 10.6	AREA 10	CLOUD T/A 7/8	CL/TR	WEATHER X2	ORIG WBS 078	1 SQUARE 09

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
10.6	OBS	00000	- 0.75	21.349	17.15		1427.0	08.60	0.20		0.00	TRC	006.	
10.6	OBS	00005	- 0.77	21.356	17.16		1427.0	08.60	0.13		0.08	TRC	007.	
10.6	OBS	00010	- 0.56	27.412	22.03		1436.3	08.55	0.61		0.07	TRC	007.	
10.6	OBS	00015	- 0.62	29.318	23.57		1438.8	08.55	0.77		0.07	00.1	007.	
10.6	OBS	00024	01.40	31.015	24.85		1450.5	08.25	0.79		0.13	00.2	011.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00028	AIR TEMP -01.7	DIR HGT PER	WIND-DIR 01	INST NANSEN CAST	TEN SQ 1616
CONSEC 0067	MONTH 09	SHIP GL	WET BULB -01.9	00 0 X	WIND-SPD 08	TRACE DIR	5 SQUARE 2
LAT 70 58.2N	DAY 11	DATA USE 1	BAROMETR 1008.2	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 149 52.9W	HOUR 14.0	AREA 10	CLOUD T/A 6/6	CL/TR	WEATHER X1	ORIG WBS 079	1 SQUARE 09

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
14.0	OBS	00000	- 0.67	21.245	17.07		1427.2	08.62	0.37		0.07	00.1	003.	
14.0	OBS	00005	- 0.18	24.670	19.82		1434.3	08.69	0.34		0.00	TRC	003.	
14.0	OBS	00010	- 0.42	29.150	23.43		1439.4	08.96	0.61		0.05	00.0	003.	
14.0	OBS	00015	00.60					09.00	1.11		0.06	TRC	004.	
14.0	OBS	00020	- 0.23	29.958	24.08		1441.6	08.60	1.18		0.15	00.1	005.	
14.0	OBS	00025	01.44	31.081	24.90		1450.8	08.27	1.54		0.22	00.3	008.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00028	AIR TEMP -01.2	DIR HGT PER	WIND-DIR 36	INST NANSEN CAST	TEN SQ 1616
CONSEC 0068	MONTH 09	SHIP GL	WET BULB -02.2	00 0 X	WIND-SPD 04	TRACE DIR	5 SQUARE 2
LAT 70 55.7N	DAY 11	DATA USE 1	BAROMETR 1009.2	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 149 23.2W	HOUR 17.9	AREA 10	CLOUD T/A 6/6	CL/TR	WEATHER X1	ORIG WBS 080	1 SQUARE 09

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
17.9	OBS	00000	- 0.60	21.089	16.94		1427.3	08.70	0.00		0.00	TRC	003.	
17.9	OBS	00005	- 0.40	22.708	18.25		1430.6	08.70	0.00		0.03	00.1	004.	
17.9	OBS	00010	- 0.42	27.780	22.33		1437.5	08.69	0.50		0.02	00.0	003.	
17.9	OBS	00015	- 0.34	29.919	24.05		1440.9	08.93	1.01		0.05	TRC	004.	
17.9	OBS	00020	01.17					09.33	1.26		0.06	00.1	006.	
17.9	OBS	00025	01.90	31.187	24.95		1453.0	08.70	1.28		0.23	00.3	010.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTOP 00044	AIR TEMP -01.2	DIR HGT PER	WIND-DIR 35	INST NANSEN CAST	TEN SQ 1616
CONSEC 0069	MONTH 09	SHIP GL	WET BULB -01.9	00 0 X	WIND-SPD 06	TRACE DIR	5 SQUARE 2
LAT 71 08.1N	DAY 11	DATA USE 1	BAROMETR 1011.1	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 149 22.2W	HOUR 23.5	AREA 10	CLOUD T/A 6/4	CL/TR	WEATHER X1	ORIG WBS 081	1 SQUARE 19

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
23.5	OBS	00000	- 0.72	20.054	16.11		1425.4	08.64	0.24		0.12	TRC	004.	
23.5	OBS	00005	00.67	23.108	18.55		1436.1	08.67	0.30		0.15	00.2	004.	
23.5	OBS	00010	- 0.80	27.536	22.14		1435.4	09.30	0.56		0.15	00.2	003.	
23.5	OBS	00015	- 1.07	29.436	23.68		1436.8	09.56	0.63		0.07	TRC	003.	
23.5	OBS	00020	- 1.22	30.410	24.47		1437.5	09.43	0.56		0.12	00.1	004.	
23.5	OBS	00025	- 1.37	30.983	24.93		1437.7	08.47	0.60		0.13	00.2	007.	
23.5	OBS	00035	- 1.01	31.717	25.52		1440.6	07.98	1.05		0.29	01.9	012.	
23.5	OBS	00042	- 0.59	31.913	25.66		1443.0	08.03	1.04		0.37	02.2	013.	

N C O C S T A T I O N D A T A

REFIO	31	8286	YEAR	1971	BDTOP	00107	AIR TEMP	-03.6	DIR HGT PER		WIND-DIR	32	INST NANSEN CAST		TEN SQ	1616
CONSEC		0070	MONTH	09	SHIP	GL	WET BULB	-03.9	00 0	X	WIND-SPD	02	TRACE DIR		5 SQUARE	2
LAT	71	11.5N	DAY	12	DATA USE	1	BAROMETR	1013.2	SEA		WIND-FOR		DURATION		2 SQUARE	08
LONG	149	46.4W	HOUR	04.6	AREA	10	CLOUD T/A	6/7	CL/TR		WEATHER	X1	ORIG WBS	083	1 SQUARE	19

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
04.6	OBS	00000	- 0.86	20.299	16.30		1425.0	08.64	0.25		0.14	00.1	004.	
04.6	OBS	00005	- 0.92	22.180	17.82		1427.4	08.67	0.16		0.11	00.1	003.	
04.6	OBS	00010	- 0.83	26.170	21.04		1433.3	09.30	0.28		0.18	00.2	003.	
04.6	OBS	00015	- 1.15	29.566	23.78		1436.6	09.41	0.48		0.08	00.0	003.	
04.6	OBS	00020	- 1.06	30.516	24.55		1438.4	09.42	0.50		0.19	00.1	004.	
04.6	OBS	00025	- 1.25	30.938	24.89		1438.2	09.15	0.62		0.37	00.5	006.	
04.6	OBS	00040	- 0.84	31.954	25.70		1441.8	07.92	0.94		0.42	03.6	013.	
04.6	OBS	00050	- 0.87	32.248	25.94		1442.3	08.92	1.09		0.58	04.1	016.	
04.6	OBS	00060	- 0.98	32.709	26.32		1442.6	07.38	1.35		0.56	05.5	022.	
04.6	OBS	00080	- 1.37	33.077	26.63		1441.6	06.82	1.93		0.52	07.3	026.	
04.6	OBS	00100	- 1.41	33.275	26.79		1442.0	06.71	1.95		0.44	07.1	027.	

N D O C S T A T I O N D A T A

REFIO	31	8286	YEAR	1971	BDTOP	00530	AIR TEMP	-02.6	DIR HGT PER		WIND-DIR	26	INST STD RECDROER		TEN SQ	1617
CONSEC		0071	MONTH	09	SHIP	GL	WET BULB	-02.9	00 0	X	WIND-SPD	04	TRACE DIR	0	5 SQUARE	1
LAT	71	17.2N	DAY	12	DATA USE	1	BAROMETR	1014.7	SEA		WIND-FOR		DURATION		2 SQUARE	00
LONG	150	24.0W	HOUR	12.5	AREA	10	CLOUD T/A		CL/TR		WEATHER	X2	ORIG WBS	084	1 SQUARE	10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
12.5	OBS	00000						08.77	0.27		0.07	00.9	003.	
	OBS	00006	- 0.99											
	OBS	00010	- 0.82											
	OBS	00014	- 0.86											
	OBS	00020	01.00					09.02	0.38		0.22	01.6	005.	
	OBS	00025	01.25					08.59	0.55		0.36	01.0	007.	
	OBS	00030	00.35											
	OBS	00036	00.00											
	OBS	00039	01.04	31.86	25.54		1450.3	08.84	0.73		0.21	01.0	010.	
	OBS	00042	- 0.88											
	OBS	00050	- 1.05	32.56	26.20		1441.8							
	OBS	00051	- 1.08	32.62	26.25		1441.8							
	OBS	00056	- 1.09	32.67	26.29		1441.9							
	OBS	00060	- 1.20	32.74	26.35		1441.6							
	OBS	00075	- 1.15	32.93	26.50		1442.3							
	OBS	00087	- 1.43	33.04	26.60		1441.3							
	OBS	00100	- 1.17	33.22	26.74		1443.0							
	OBS	00116	- 1.39	33.32	26.83		1442.4							
	OBS	00140	- 1.37	33.73	27.16		1443.5							
	OBS	00150	- 1.34	33.86	27.26		1444.0	06.33	0.87		0.46	12.5	028.	
	OBS	00156	- 1.32	33.98	27.36		1444.3							
	OBS	00200	- 0.42	34.53	27.77		1450.0	05.99	1.61		0.29	10.8	019.	
	OBS	00226	- 0.13	34.71	27.90		1452.0							
	OBS	00232	- 0.11	34.71	27.90		1452.2							
	OBS	00240	00.04											
	OBS	00250	00.04	34.78	27.95		1453.3	06.21	1.54		0.37	11.6	012.	
	OBS	00300	00.13	34.82	27.97		1454.6							
	OBS	00400	00.27	34.90	28.03		1457.0							
	OBS	00420	00.30	34.92	28.05		1457.5	06.21	1.33		0.38	11.4	013.	

N D O C S T A T I O N D A T A

REFIO	31	8286	YEAR	1971	BDTOP	01829	AIR TEMP	-02.3	DIR HGT PER		WIND-DIR	21	INST NANSEN CAST		TEN SQ	1617
CONSEC		0072	MONTH	09	SHIP	GL	WET BULB	-02.5	00 0	X	WIND-SPD	02	TRACE DIR		5 SQUARE	1
LAT	71	30.2N	DAY	13	DATA USE	1	BAROMETR	1020.6	SEA		WIND-FOR		DURATION		2 SQUARE	00
LONG	150	31.1W	HOUR	08.0	AREA	10	CLOUD T/A	6/7	CL/TR		WEATHER	X1	ORIG WBS	086	1 SQUARE	10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
08.0	OBS	01500	- 0.37	34.920	28.08		1472.3	06.74	0.87		0.14	08.4	009.	
08.0	OBS	01550	- 0.36	34.919	28.08		1473.2	06.75	0.86		0.44	14.9	011.	
08.0	OBS	01600	- 0.35	34.920	28.08		1474.1	06.70	0.86		0.66	15.3	012.	
08.0	OBS	01650	- 0.38	34.926	28.09		1474.8	06.72	0.85		0.60	15.3	012.	
08.0	OBS	01700	- 0.38	34.927	28.09		1475.6	06.68	0.82		0.08	15.3	011.	
08.0	OBS	01750	- 0.38	34.936	28.09		1476.5	06.71	0.83		0.14	15.3	012.	
08.0	OBS	01800	- 0.40	34.943	28.10		1477.3	06.68	0.80		0.15	15.3	012.	

N O D C S T A T I O N D A T A

REFID 31 B286	YEAR 1971	BOTDP 01820	AIR TEMP -02.3	DIR HGT PER	WIND-DIR 21	INST STD RECCRDER	TEN SQ 1617
CONSEC 0073	MDNTH 09	SHIP GL	WET BULB -02.5	00 0 X	WIND-SPD 02	TRACE DIR 0	5 SQUARE 1
LAT 71 30.2N	DAY 13	DATA USE 1	BAROMETR 1020.6	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 31.3W	HOUR 10.3	AREA 10	CLOUD T/A	CL/TR	WEATHER X1	ORIG WBS 086	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
10.3	DBS	00000						08.79	0.00		0.08	TRC	003.	
	OBS	00010						09.10	0.30		0.08	00.1	004.	
	OBS	00011	- 0.78											
	OBS	00018	03.00	30.68	24.47		1457.0							
	DBS	00020	03.20	30.78	24.53		1458.1	08.10	0.32		0.08	TRC	003.	
	OBS	00024	02.20	31.01	24.79		1454.1							
	OBS	00030	02.52	31.29	24.99		1456.0							
	DBS	00032	02.65	31.39	25.06		1456.7							
	OBS	00034	02.25	31.40	25.10		1455.0	08.12	0.79		0.28	00.2	009.	
	DBS	00040	00.60	31.68	25.42		1448.1	08.53	1.00		0.47	01.1	010.	
	OBS	00042	00.05	31.70	25.47		1445.6							
	DBS	00050	- 0.75	32.24	25.93		1442.8							
	OBS	00052	- 1.08	32.27	25.97		1441.3							
	OBS	00056	- 1.01	32.42	26.05		1441.9							
	OBS	00060	- 1.10	32.52	26.17		1441.7	07.92	1.47		0.24	04.8	021.	
	OBS	00075	- 1.22	32.80	26.40		1441.8							
	OBS	00085	- 1.33	32.95	26.52		1441.7							
	OBS	00088	- 1.15	33.01	26.57		1442.6							
	OBS	00097	- 1.36	33.09	26.64		1441.9							
	OBS	00100	- 1.32	33.12	26.66		1442.2							
	DBS	00105	- 1.36	33.18	26.71		1442.2							
	OBS	00108	- 1.20	33.24	26.76		1443.1							
	DBS	00125	- 1.36	33.35	26.85		1442.7							
	OBS	00134	- 1.41	33.45	26.93		1442.8							
	OBS	00141	- 1.35	33.52	26.99		1443.3							
	DBS	00150	- 1.44	33.60	27.05		1443.1							
	OBS	00159	- 1.46	33.70	27.14		1443.3							
	OBS	00200	- 0.39	34.58	27.81		1450.2							
	OBS	00206	- 0.25	34.66	27.86		1451.1							
	DBS	00250	00.15	34.82	27.97		1453.9							
	DBS	00300	00.32	34.90	28.03		1455.6							
	OBS	00400	00.36	34.99	28.10		1457.6							
	OBS	00484	00.37	35.00	28.11		1459.0	06.59	0.91		0.35	09.2	009.	
	OBS	00500	00.37	35.00	28.11		1459.3							
	DBS	00600	00.26	34.99	28.10		1460.4							
	DBS	00635	00.24	35.01	28.12		1461.0	06.75	0.88		0.19	09.2	011.	
	DBS	00700	00.18	35.01	28.12		1461.8							
	DBS	00800	00.06	35.01	28.13		1462.9	06.77	0.89		0.00	14.3	012.	
	OBS	00900	- 0.05	35.02	28.15		1464.1							
	DBS	01000	- 0.12	35.03	28.16		1465.5							
	DBS	01100	- 0.18	35.04	28.17		1466.9							
	DBS	01200	- 0.23	35.04	28.17		1468.3							
	DBS	01300	- 0.28	35.05	28.18		1469.8							
	DBS	01400	- 0.33	35.06	28.19		1471.3							
	DBS	01500	- 0.37	35.06	28.19		1472.8							
	DBS	01513	- 0.38	35.06	28.19		1473.0	06.64						

N O O C S T A T I O N C A T A

REFID 31 B286	YEAR 1971	BOTDP 00113	AIR TEMP -02.2	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1617
CONSEC 0074	MONTH 09	SHIP GL	WET BULB -02.5	00 0 X	WIND-SPD 03	TRACE DIR	5 SQUARE 1
LAT 71 38.8N	DAY 15	DATA USE 1	BAROMETR 1021.2	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 152 59.6W	HOUR 04.7	AREA 10	CLOUD T/A 7/7	CL/TR	WEATHER X1	ORIG WBS 087	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
04.7	DBS	00000	- 1.05	25.168	20.23		1430.8	08.59	0.35		0.11	00.2	003.	
04.7	DBS	00010	00.94					08.52	0.23		0.08	00.1	003.	
04.7	OBS	00015	00.16	25.553	20.52		1437.2	08.60	0.24		0.16	00.2	004.	
04.7	DBS	00020	00.81	27.623	22.16		1443.2	08.99	0.27		0.21	00.4	005.	
04.7	DBS	00025	01.24	30.561	24.49		1449.2	08.89	0.28		0.20	00.5	005.	
04.7	DBS	00030	01.99	31.057	24.84		1453.3	08.40	0.43		0.39	01.2	008.	
04.7	DBS	00040	- 0.52	32.012	25.74		1443.4	08.61	1.16		0.39	03.1	012.	
04.7	DBS	00050	- 0.94	32.351	26.03		1442.1	07.99	1.18		0.40	06.2	016.	
04.7	OBS	00060	- 1.12	32.556	26.20		1441.7	07.59	1.19		0.45	07.7	019.	
04.7	DBS	00080	- 1.20	32.923	26.50		1442.1	07.41	1.21		0.52	08.7	023.	
04.7	DBS	00090	- 1.28	32.949	26.52		1442.0	07.29	1.34		0.59	09.5	022.	

N O D C S T A T I O N D A T A

REFIO	31 8286	YEAR 1971	BOTOP 00058	AIR TEMP	-00.9	DIR HGT PER	WIND-DIR 27	INST NANSEN CAST	TEN SQ 1617
CONSEC	0075	MONTH 09	SHIP GL	WET BULB	-01.1	00 0 X	WIND-SPD 02	TRACE DIR	5 SQUARE 1
LAT	71 34.4N	DAY 15	DATA USE 1	BAROMETR	1023.8	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG	152 55.2W	HOUR 11.9	AREA 10	CLOUD T/A	7/8	CL/TR	WEATHER X7	ORIG WBS 088	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
11.9	OBS	00000	- 0.85	24.035	19.32		1430.2	08.50	0.49		0.05	00.0	006.	
11.9	OBS	00010	- 0.78	25.342	20.37		1432.4	08.41	0.30		0.07	00.1	005.	
11.9	OBS	00020	02.95	29.476	23.51		1455.2	07.86	0.61		0.07	00.2	009.	
11.9	OBS	00025	01.50	30.190	24.18		1449.9	09.10	0.75		0.11	00.6	009.	
11.9	OBS	00030	01.08	30.635	24.56		1448.7	09.41	0.77		0.07	00.5	010.	
11.9	OBS	00040	- 0.24	31.871	25.62		1444.5	08.86	1.16		0.07	01.2	014.	
11.9	OBS	00055	- 0.86	32.475	26.13		1442.7	07.92	1.47		0.22	06.1	026.	

N O D C S T A T I O N D A T A

REFIO	31 8286	YEAR 1971	BOTOP 00093	AIR TEMP	-00.6	DIR HGT PER	WIND-DIR 18	INST NANSEN CAST	TEN SQ 1617
CONSEC	0076	MONTH 09	SHIP GL	WET BULB	-00.6	00 0 X	WIND-SPD 03	TRACE DIR	5 SQUARE 1
LAT	71 22.2N	DAY 15	DATA USE 1	BAROMETR	1024.2	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG	152 51.9W	HOUR 14.8	AREA 10	CLOUD T/A	X/9	CL/TR	WEATHER X4	ORIG WBS 089	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
14.8	OBS	00000	- 0.92	22.998	18.48		1428.4	08.62	0.18		0.11	00.5	005.	
14.8	OBS	00010	- 0.29	25.773	20.71		1435.4	08.50	0.19		0.09	00.5	004.	
14.8	OBS	00020	02.37	29.795	23.81		1453.1	08.41	0.45		0.10	00.6	007.	
14.8	OBS	00030	01.74	30.551	24.45		1451.5	08.46	0.62		0.12	00.9	007.	
14.8	OBS	00040	00.34	31.636	25.40		1446.8	08.81	1.03		0.11	01.9	011.	
14.8	OBS	00050	- 0.61	32.202	25.90		1443.4	08.38	1.44		0.28	04.5	020.	
14.8	OBS	00060	- 0.80	32.413	26.07		1443.0	08.09	1.64		0.25	05.6	023.	
14.8	OBS	00070	- 0.96	32.683	26.30		1442.8	07.99	1.70		0.24	06.2	025.	
14.8	OBS	00078	- 1.14	32.838	26.43		1442.3	07.57	1.78		0.25	08.2	027.	

N O D C S T A T I O N D A T A

REFIO	31 8286	YEAR 1971	BOTOP 00022	AIR TEMP	01.7	DIR HGT PER	WIND-DIR 19	INST NANSEN CAST	TEN SQ 1617
CONSEC	0077	MONTH 09	SHIP GL	WET BULB	01.7	00 0 X	WIND-SPD 11	TRACE DIR	5 SQUARE 1
LAT	71 07.5N	DAY 15	DATA USE 1	BAROMETR	1024.8	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG	153 00 W	HOUR 19.7	AREA 10	CLOUD T/A	6/7	CL/TR	WEATHER X1	ORIG WBS 090	1 SQUARE 13

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
19.7	OBS	00000	00.92	24.996	20.05		1439.8	08.67	0.55		0.21	00.1	004.	
19.7	OBS	00005	- 0.80					08.63	0.51		0.08	00.0	004.	
19.7	OBS	00010	00.89	28.661	22.99		1444.8	08.51	0.76		0.19	TRC	007.	
19.7	OBS	00015	01.21	31.065	24.90		1449.6	08.49	0.82		0.45	01.0	013.	
19.7	OBS	00020	01.22	31.097	24.92		1449.8	08.45	0.84		0.47	01.0	013.	

N O D C S T A T I O N D A T A

REFIO	31 8286	YEAR 1971	BOTOP 00022	AIR TEMP	01.7	DIR HGT PER	WIND-DIR 19	INST NANSEN CAST	TEN SQ 1617
CONSEC	0078	MONTH 09	SHIP GL	WET BULB	01.7	00 0 X	WIND-SPD 11	TRACE DIR	5 SQUARE 1
LAT	71 07.5N	DAY 15	DATA USE 1	BAROMETR	1024.8	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG	153 00 W	HOUR 22.1	AREA 10	CLOUD T/A	6/7	CL/TR	WEATHER X1	ORIG WBS 090	1 SQUARE 13

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
22.1	OBS	00000	- 0.85	22.884	18.39		1428.6	08.68	0.48		0.22	00.1	004.	
22.1	OBS	00005	- 0.76	25.160	20.22		1432.2	08.58	0.50		0.19	TRC	005.	
22.1	OBS	00010	00.58	28.338	22.74		1442.9	08.46	0.79		0.24	00.1	006.	
22.1	OBS	00015	01.25	31.001	24.84		1449.7	08.44	0.80		0.48	00.9	013.	
22.1	OBS	00020	01.24	31.028	24.87		1449.8	08.46	0.80		0.63	00.9	012.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00022	AIR TEMP 02.5	DIR HGT PER	WIND-DIR 18	INST NANSEN CAST	TEN SQ 1617
CONSEC 0079	MONTH 09	SHIP GL	WET BULB 02.0	00 0 X	WIND-SPD 11	TRACE DIR	5 SQUARE 1
LAT 71 07.5N	DAY 16	DATA USE 1	BAROMETR 1024.6	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 153 00 W	HOUR 00.0	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X1	ORIG WBS 090	1 SQUARE 13

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
00.0	OBS	00000	- 0.70	22.811	18.33		1429.2	08.63	0.49		0.00	TRC	004.	
00.0	OBS	00005	- 0.69	25.189	20.25		1432.6	08.42	0.41		0.28	TRC	004.	
00.0	OBS	00010	00.63	28.698	23.03		1443.6	08.44	0.73		0.29	TRC	006.	
00.0	OBS	00015	01.31	30.916	24.77		1449.8	08.34	0.76		0.42	00.8	012.	
00.0	OBS	00020	01.29	30.953	24.80		1449.9	08.39	0.81		0.32	00.7	012.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00022	AIR TEMP 02.8	DIR HGT PER	WIND-DIR 25	INST NANSEN CAST	TEN SQ 1617
CONSEC 0040	MONTH 09	SHIP GL	WET BULB 02.2	00 0 X	WIND-SPD 04	TRACE DIR	5 SQUARE 1
LAT 71 07.5N	DAY 16	DATA USE 1	BAROMETR 1023.6	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 153 00 W	HOUR 02.1	AREA 10	CLOUD T/A 4/8	CL/TR	WEATHER X2	ORIG WBS 090	1 SQUARE 13

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
02.1	OBS	00000	- 0.73	23.274	18.70		1429.7	08.61	0.53		0.00	TRC	004.	
02.1	OBS	00005	- 0.58	25.514	20.51		1433.5	08.54	0.49		0.00	00.0	004.	
02.1	OBS	00010	00.66	28.855	23.16		1444.0	08.44	0.70		0.08	TRC	006.	
02.1	OBS	00015	01.32	30.840	24.71		1449.8	08.39	0.71		0.18	00.8	012.	
02.1	OBS	00020	01.31	30.858	24.73		1449.8	08.37	0.80		0.19	00.7	011.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00022	AIR TEMP 02.8	DIR HGT PER	WIND-DIR 25	INST NANSEN CAST	TEN SQ 1617
CONSEC 0081	MONTH 09	SHIP GL	WET BULB 02.2	00 0 X	WIND-SPD 04	TRACE DIR	5 SQUARE 1
LAT 71 07.5N	DAY 16	DATA USE 1	BAROMETR 1023.6	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 153 00 W	HOUR 04.0	AREA 10	CLOUD T/A 4/8	CL/TR	WEATHER X2	ORIG WBS 090	1 SQUARE 13

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
04.0	OBS	00000	- 0.84	24.081	19.35		1430.3	08.50	0.57		0.00	00.0	009.	
04.0	OBS	00010	00.65	28.876	23.17		1444.0	08.56	0.81		0.36	TRC	010.	
04.0	OBS	00015	01.34	30.789	24.67		1449.8		0.82		0.61	00.6	013.	
04.0	OBS	00020	01.34	30.801	24.68		1449.9		0.84		0.66	00.8	013.	

N O D C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BOTDP 00022	AIR TEMP 01.1	DIR HGT PER	WIND-DIR 15	INST NANSEN CAST	TEN SQ 1617
CONSEC 0082	MONTH 09	SHIP GL	WET BULB 00.6	00 0 X	WIND-SPD 02	TRACE DIR	5 SQUARE 1
LAT 71 07.5N	DAY 16	DATA USE 1	BAROMETR 1021.7	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 153 00 W	HOUR 06.3	AREA 10	CLOUD T/A 4/8	CL/TR	WEATHER X2	ORIG WBS 090	1 SQUARE 13

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
06.3	OBS	00000	- 0.86	23.771	19.10		1429.7	07.89	0.42		0.00	00.0	007.	
06.3	OBS	00005	- 0.67	24.942	20.05		1432.3	08.39	0.38		0.55	TRC	008.	
06.3	OBS	00010	00.50	28.468	22.85		1442.7	08.39	0.71		0.00	TRC	010.	
06.3	OBS	00015	01.37	30.661	24.57		1449.8	08.34	0.75		0.62	00.6	013.	
06.3	OBS	00020	01.38	30.672	24.57		1449.9	08.32	0.81		0.66	00.6	013.	

N D O C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BDTDP 00052	AIR TEMP 00.0	DIR HGT PER	WIND-DIR 26	INST NANSEN CAST	TEN SQ 1617
CONSEC 0083	MONTH 09	SHIP GL	WET BULB 00.0	00 0 X	WIND-SPD 02	TRACE DIR	5 SQUARE 1
LAT 71 23 N	DAY 16	DATA USE 1	BAROMETR 1020.2	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 153 34 W	HOUR 11.0	AREA 10	CLOUD T/A 4/3	CL/TR	WEATHER X1	ORIG WBS 091	1 SQUARE 13

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
11.0	OBS	00000	- 0.77	23.212	18.65		1429.4	08.50	1.00		0.00	00.0	005.	
11.0	OBS	00010	- 0.71	24.057	19.33		1431.0	08.47	0.90		0.00	00.3	005.	
11.0	OBS	00015	01.22	27.840	22.32		1445.2	08.39	0.96		0.09	00.5	006.	
11.0	OBS	00020	03.08	29.072	23.18		1455.3	07.76	0.92		0.00	00.5	008.	
11.0	OBS	00025	02.25	29.850	23.86		1452.7	08.37	0.95		0.12	00.3	009.	
11.0	OBS	00030	02.34	30.672	24.51		1454.3	08.37	1.00		0.18	00.5	008.	
11.0	OBS	00035	02.43	31.039	24.80		1455.3	07.89	0.99		0.36	01.4	007.	
11.0	OBS	00048	- 0.49	32.280	25.96		1444.0	08.12	1.43		0.43	05.5	011.	

N D O C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BDTDP 00037	AIR TEMP -00.1	DIR HGT PER	WIND-DIR 14	INST NANSEN CAST	TEN SQ 1617
CONSEC 0084	MONTH 09	SHIP GL	WET BULB -00.6	00 0 X	WIND-SPD 03	TRACE DIR	5 SQUARE 1
LAT 71 22.6N	DAY 16	DATA USE 1	BAROMETR 1017.2	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 154 04.2W	HOUR 13.4	AREA 10	CLOUD T/A 4/3	CL/TR	WEATHER X1	ORIG WBS 092	1 SQUARE 14

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
13.4	OBS	00000	- 0.85	23.248	18.68		1429.1	08.46	0.64		0.00	00.0	008.	
13.4	OBS	00010	- 0.36	25.793	20.73		1435.1	08.43	0.68		0.00	00.1	008.	
13.4	OBS	00015	01.28	27.939	22.39		1445.6	08.52	0.72		0.00	00.3	009.	
13.4	OBS	00020	02.22	29.630	23.69		1452.2	08.31	0.75		0.00	00.3	009.	
13.4	OBS	00025	02.78	30.321	24.20		1455.7	08.17	0.85		0.23	00.3	011.	
13.4	OBS	00030	00.73	30.788	24.70		1447.5	09.17	1.01		0.11	00.1	012.	
13.4	OBS	00035	00.71	31.235	25.06		1447.9	08.79	1.37		0.34	00.8	018.	

N D O C S T A T I O N D A T A

REFID 31 8286	YEAR 1971	BDTDP 00031	AIR TEMP 00.1	DIR HGT PER	WIND-DIR 14	INST NANSEN CAST	TEN SQ 1617
CONSEC 0085	MONTH 09	SHIP GL	WET BULB -00.1	00 0 X	WIND-SPD 02	TRACE DIR	5 SQUARE 1
LAT 71 25.2N	DAY 16	DATA USE 1	BAROMETR 1015.4	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 154 28.2W	HOUR 15.6	AREA 10	CLOUD T/A 4/8	CL/TR	WEATHER X2	ORIG WBS 093	1 SQUARE 14

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
15.6	OBS	00000	- 0.71	23.555	19.25		1430.7	08.48	0.65				008.	
15.6	OBS	00010	- 0.44	25.638	20.60		1434.5	08.41	0.68				008.	
15.6	OBS	00015	01.63	29.103	23.30		1448.8	08.39	0.69				009.	
15.6	OBS	00022	01.71	30.848	24.69		1451.7	08.30	0.71				014.	
15.6	OBS	00028	01.59	30.912	24.75		1451.3	08.28	0.73				015.	

N O D C S T A T I O N D A T A

A R C H I V E L I S T I N G

REFID 31 2183	YEAR 1972	BOTDP 00024	AIR TEMP 06.7	DIR HGT PER	WIND-DIR 18	INST NANSEN CAST	TEN SQ 1518
CONSEC 0001	MONTH 07	SHIP SI	WET BULB 05.6	18 4 1	WIND-SPD 09	TRACE DIR	5 SQUARE 3
LAT 69 48 N	DAY 04	DATA USE 1	BAROMETR 1027.1	SEA	WIND-FOR	DURATION	2 SQUARE 82
LONG 163 34 W	HOUR 19.6	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG WBS 01A	1 SQUARE 93

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	05.91	29.09	22.93	00.000	1466.9	08.17						
19.6	OBS	00000	05.91	29.087	22.93		1466.9	08.17	0.27		0.05	00.0	000.	
19.6	OBS	00005	00.61	32.673	26.22		1448.9		0.97		0.06	00.0	000.	
	STD	00010	- 0.79	33.47	26.93	00.030	1443.7	10.40						
19.6	OBS	00010	- 0.79	33.470	26.93		1443.7	10.40	0.74		0.00	00.0	000.	
19.6	OBS	00015	- 1.50	33.803	27.22		1440.9	07.33	1.46		0.38	10.7	018.	
19.6	OBS	00016	- 1.50	33.695	27.13 *		1440.8	07.13	1.99		0.18	09.5	032.	

N O D C S T A T I O N D A T A

REFID 31 2183	YEAR 1972	BOTDP 00025	AIR TEMP 06.7	DIR HGT PER	WIND-DIR 20	INST NANSEN CAST	TEN SQ 1618
CONSEC 0002	MONTH 07	SHIP SI	WET BULB 05.6	20 1 2	WIND-SPD 07	TRACE DIR	5 SQUARE 1
LAT 70 24 N	DAY 04	DATA USE 1	BAROMETR 1026.8	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 162 23 W	HOUR 19.8	AREA 10	CLOUD T/A 8/6	CL/TR	WEATHER X2	ORIG WBS 02A	1 SQUARE 02

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.19	30.09	23.98	00.000	1456.8	09.40						
19.8	OBS	00000	03.19	30.086	23.98		1456.8	09.40	0.34		0.13	00.0	000.	
19.8	OBS	00005	01.10	31.064	24.90		1448.9	09.94	0.79		0.06	00.0	001.	
	STD	00010	- 1.05	32.01	25.76	00.031	1440.4	10.80						
19.8	OBS	00010	- 1.05	32.009	25.76		1440.4	10.80	0.67		0.00	00.0	002.	
19.8	OBS	00015	- 1.10					10.80	0.53		0.09	00.0	007.	
	STD	00020	- 0.90	33.39	26.87	00.048	1443.2	06.81						
19.8	OBS	00020	- 0.90	33.393	26.87		1443.2	06.81	1.65		0.18	10.3	012.	

N O D C S T A T I O N D A T A

REFID 31 2183	YEAR 1972	BOTOP 00025	AIR TEMP 03.9	DIR HGT PER	WIND-DIR 20	INST NANSEN CAST	TEN SQ 1618
CONSEC 0003	MONTH 07	SHIP SI	WET BULB 03.3	20 1 2	WIND-SPD 04	TRACE DIR	5 SQUARE 1
LAT 70 24 N	DAY 04	DATA USE 1	BAROMETR 1026.5	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 162 23 W	HOUR	AREA 10	CLOUD T/A 8/6	CL/TR	WEATHER X2	ORIG WBS 03A	1 SQUARE 02

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	02.97	29.94	23.88	00.000	1455.6	09.26						
19.0	OBS	00000	02.97	29.937	23.88		1455.6	09.26	0.41		0.02	00.0	000.	
19.0	OBS	00005	00.72	31.417	25.21		1447.7	10.25	0.57		0.00	00.0	000.	
	STD	00010	- 1.13	32.16	25.88	00.031	1440.3	10.96						
19.0	OBS	00010	- 1.13	32.160	25.88		1440.3	10.96	0.34		0.00	00.0	004.	
19.0	OBS	00015	- 1.08	33.112	26.65		1441.9	10.61	0.73		0.11	00.0	003.	
	STD	00020	- 0.29	33.55	26.97	00.047	1446.3							
19.0	OBS	00020	- 0.29	33.548	26.97		1446.3		1.76		0.08	01.8	018.	

N O D C S T A T I O N D A T A

REFID 31 2183	YEAR 1972	BOTDP 00020	AIR TEMP 06.4	DIR HGT PER	WIND-DIR 00	INST NANSEN CAST	TEN SQ 1618
CONSEC 0004	MONTH 07	SHIP SI	WET BULB 05.4	00 0 0	WIND-SPD 00	TRACE DIR	5 SQUARE 1
LAT 70 40 N	DAY 05	DATA USE 1	BAROMETR 1026.9	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 160 10 W	HOUR 01.4	AREA 10	CLOUD T/A 8/5	CL/TR	WEATHER X1	ORIG WBS 04A	1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.33	30.43	24.44	00.000	1444.5	09.42						
01.4	OBS	00000	00.33	30.433	24.44		1444.5	09.42	0.01		0.07	00.0	000.	
01.4	OBS	00005	00.15	30.916	24.83		1444.4	09.79	0.44		0.00	00.0	000.	
	STD	00010	- 0.94	31.86	25.63	00.029	1440.7	10.21						
01.4	OBS	00010	- 0.94	31.856	25.63		1440.7	10.21	1.08		0.03	00.0	003.	
01.4	OBS	00015	- 1.24	32.898	26.48		1440.9	09.70	0.96		0.02	00.0	002.	

N D O C S T A T I O N D A T A

REFID	31	2183	YEAR	1972	BDTOP	00020	AIR TEMP	05.0	DIR HGT PER		WIND-DIR	10	INST NANSEN CAST		TEN SQ	1618
CONSEC		0005	MONTH	07	SHIP SI		WET BULB	03.9	00 0	0	WIND-SPD	03	TRACE DIR		5 SQUARE	1
LAT	70 40	N	DAY	05	DATA USE	1	BAROMETR	1025.7	SEA		WIND-FOR		DURATION		2 SQUARE	00
LONG	160 10	W	HOUR	03.3	AREA	10	CLOUD T/A	X/9	CL/TR		WEATHER	X4	ORIG WBS	05A	1 SQUARE	00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.72	29.11	23.36	00.000	1444.4	08.95						
03.3	OBS	00000	00.72	29.109	23.36		1444.4	08.95	0.05		0.07	00.0	000.	
03.3	OBS	00005	00.13	30.916	24.83		1444.3	09.79	0.68		0.09	00.0	000.	
	STD	00010	- 0.73	31.61	25.43	00.035	1441.4	10.34						
03.3	OBS	00010	- 0.73	31.612	25.43		1441.4	10.34	0.89		0.13	00.1	004.	
03.3	OBS	00015	00.99	32.837	26.33		1451.0	09.81	1.03		0.00	00.0	007.	

N D O C S T A T I O N D A T A

REFID	31	2183	YEAR	1972	BDTOP	00020	AIR TEMP	07.8	DIR HGT PER		WIND-DIR	00	INST NANSEN CAST		TEN SQ	1618
CONSEC		0006	MONTH	07	SHIP SI		WET BULB	05.6	00 0	0	WIND-SPD	00	TRACE DIR		5 SQUARE	1
LAT	70 40	N	DAY	05	DATA USE	1	BAROMETR	1025.4	SEA		WIND-FOR		DURATION		2 SQUARE	00
LONG	160 10	W	HOUR	05.2	AREA	10	CLOUD T/A	X/9	CL/TR		WEATHER	X4	ORIG WBS	06A	1 SQUARE	00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.67	29.23	23.45	00.000	1444.4	09.11						
05.2	OBS	00000	00.67	29.229	23.45		1444.4	09.11	0.00		0.07	00.0	000.	
05.2	OBS	00005	- 0.33	31.059	24.97		1442.4	10.04	0.16		0.07	00.0	000.	

N D O C S T A T I O N D A T A

REFID	31	2183	YEAR	1972	BDTOP	00020	AIR TEMP	03.9	DIR HGT PER		WIND-DIR	00	INST NANSEN CAST		TEN SQ	1618
CONSEC		0007	MONTH	07	SHIP SI		WET BULB	03.9	00 0	0	WIND-SPD	00	TRACE DIR		5 SQUARE	1
LAT	70 40	N	DAY	05	DATA USE	1	BAROMETR	1025.1	SEA		WIND-FOR		DURATION		2 SQUARE	00
LONG	160 10	W	HOUR	07.3	AREA	10	CLOUD T/A	X/9	CL/TR		WEATHER	X4	ORIG WBS	07A	1 SQUARE	00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
07.3	OBS	00015	00.78	32.513	26.08		1449.6	10.21	0.40		0.09	00.0	000.	

N D O C S T A T I O N D A T A

REFID	31	2183	YEAR	1972	BDTOP	00020	AIR TEMP	04.4	DIR HGT PER		WIND-DIR	00	INST NANSEN CAST		TEN SQ	1618
CONSEC		0008	MONTH	07	SHIP SI		WET BULB	03.3	00 0	0	WIND-SPD	00	TRACE DIR		5 SQUARE	1
LAT	70 40	N	DAY	05	DATA USE	1	BAROMETR	1025.0	SEA		WIND-FOR		DURATION		2 SQUARE	00
LONG	160 10	W	HOUR	09.4	AREA	10	CLOUD T/A	6/8	CL/TR		WEATHER	X2	ORIG WBS	08A	1 SQUARE	00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	01.72	30.29	24.25	00.000	1450.6	08.99						
09.4	OBS	00000	01.72	30.287	24.25		1450.6	08.99	0.38		0.16	00.0	000.	
09.4	OBS	00005	00.08	30.687	24.65		1443.8	09.64	0.47		0.11	00.0	006.	
	STD	00010	00.30	32.31	25.94	00.029	1447.1	10.26						
09.4	OBS	00010	00.30	32.309	25.94		1447.1	10.26	1.42		0.03	00.0	000.	
09.4	OBS	00015	01.19	32.595	26.13		1451.6	10.11	0.82		0.04	00.0	000.	

N O D C S T A T I O N D A T A

REFIO	31	2183	YEAR	1972	BOTOP	00051	AIR TEMP	03.9	DIR HGT	PER	WIND-DIR	33	INST	NANSEN	CAST	TEN SQ	1617
CONSEC		0009	MONTH	07	SHIP	SI	WET BULB	03.3	00 0	0	WIND-SPD	02	TRACE	DIR		5 SQUARE	2
LAT	71 03	N	DAY	05	DATA USE	1	BAROMETR	1024.1	SEA		WIND-FOR		DURATION			2 SQUARE	08
LONG	159 09	W	HOUR	16.3	AREA	10	CLOUD T/A	6/6	CL/TR		WEATHER	X1	DRIG	W8S	09A	1 SQUARE	19

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	- 0.35	22.78	18.31	00.000	1430.8	08.81						
16.3	O8S	00000	- 0.35	22.783	18.31		1430.8	08.81	0.00		0.00	00.0	000.	
16.3	D8S	00005	- 0.70	30.614	24.62		1440.0	10.06	0.30		0.13	01.6	007.	
	STO	00010	- 1.14	31.54	25.38	00.060	1439.3	10.12						
16.3	D8S	00010	- 1.14	31.541	25.38		1439.3	10.12	0.53		0.26	04.2	020.	
16.3	O8S	00015	- 1.62	32.900	26.49		1439.1	07.83	1.28		0.25	21.0	020.	
	STO	00020	- 1.57	32.94	26.52	00.081	1439.4	07.94						
16.3	D8S	00020	- 1.57	32.937	26.52		1439.4	07.94	1.57		0.28	17.5	026.	
16.3	O8S	00025	- 1.60	32.943	26.53		1439.4	07.85	1.34		0.22	22.8	045.	
	STO	00030	- 1.59	32.95	26.53	00.096	1439.5	07.75						
16.3	O8S	00030	- 1.59	32.948	26.53		1439.5	07.75	0.45		0.05	00.0	028.	
16.3	O8S	00035	- 1.60	32.949	26.53		1439.6	07.75	2.07		0.23	16.8	017.	
16.3	O8S	00040	- 1.58	32.950	26.53		1439.7	07.79	1.38		0.35	17.9	026.	

N O D C S T A T I O N D A T A

REFIO	31	2183	YEAR	1972	BOTOP	00027	AIR TEMP	04.4	DIR HGT	PER	WIND-DIR	09	INST	NANSEN	CAST	TEN SQ	1617
CONSEC		0010	MONTH	07	SHIP	SI	WET BULB	03.9			WIND-SPD	07	TRACE	DIR		5 SQUARE	2
LAT	71 03	N	DAY	07	DATA USE	1	BAROMETR	1022.4	SEA		WIND-FOR		DURATION			2 SQUARE	08
LONG	158 08	W	HOUR	00.3	AREA	10	CLOUD T/A	7/6	CL/TR		WEATHER	X1	DRIG	W8S	10A	1 SQUARE	18

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	- 0.40	31.09	24.99	00.000	1442.0	09.77						
00.3	D8S	00005	- 0.40	31.091	24.99		1442.1	09.77	0.16		0.00	00.0	003.	
	STO	00010	- 0.44	31.45	25.29	00.028	1442.5	09.96						
00.3	O8S	00010	- 0.44	31.454	25.29		1442.5	09.96	0.35		0.00	00.0	012.	
00.3	D8S	00015	- 0.44	31.467	25.30		1442.6	10.10	0.41		0.00	00.0	011.	
	STO	00020	- 0.46	31.55	25.36	00.055	1442.7	09.92						
00.3	O8S	00020	- 0.46	31.546	25.36		1442.7	09.92	0.34		0.16	00.0	004.	
00.3	O8S	00023	- 0.50	31.630	25.43		1442.7	10.08	0.42		0.28	00.3	015.	

N O D C S T A T I O N D A T A

REFIO	31	2183	YEAR	1972	BOTOP	00035	AIR TEMP	05.6	DIR HGT	PER	WIND-DIR	12	INST	NANSEN	CAST	TEN SQ	1617
CONSEC		0011	MONTH	07	SHIP	SI	WET BULB	04.4			WIND-SPD	07	TRACE	DIR		5 SQUARE	2
LAT	71 04	N	DAY	07	DATA USE	1	BAROMETR	1020.8	SEA		WIND-FOR		DURATION			2 SQUARE	06
LONG	157 54	W	HOUR	10.3	AREA	10	CLOUD T/A	0/2	CL/TR		WEATHER	X1	DRIG	W8S	11A	1 SQUARE	17

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	- 0.26	27.64	22.21	00.000	1437.9	08.97						
10.3	D8S	00000	- 0.26	27.641	22.21		1437.9	08.97	0.00		0.16	00.0	000.	
10.3	O8S	00005	- 0.72	31.370	25.23		1441.0	09.84	0.29		0.14	00.0	008.	
	STO	00010	- 0.46	31.43	25.27	00.042	1442.4	09.91						
10.3	O8S	00010	- 0.46	31.433	25.27		1442.4	09.91	0.34		0.06	00.0	004.	
	STO	00020	- 0.64	31.66	25.46	00.068	1442.0	10.12						
10.3	O8S	00025	- 0.72	31.718	25.51		1441.8	10.22	0.57		0.08	00.0	009.	
10.3	D8S	00027	- 0.75	31.729	25.52		1441.7	10.19	0.58		0.38	00.6	019.	

N O D C S T A T I O N D A T A

REFIO	31	2183	YEAR	1972	BOTOP	00035	AIR TEMP	06.1	DIR HGT	PER	WIND-DIR	07	INST	NANSEN	CAST	TEN SQ	1617
CONSEC		0012	MONTH	07	SHIP	SI	WET BULB	05.0			WIND-SPD	07	TRACE	DIR		5 SQUARE	2
LAT	71 04	N	DAY	07	DATA USE	1	BAROMETR	1019.1	SEA		WIND-FOR		DURATION			2 SQUARE	06
LONG	157 52	W	HOUR	12.3	AREA	10	CLOUD T/A	0/2	CL/TR		WEATHER	X1	DRIG	W8S	12A	1 SQUARE	17

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	- 0.08	27.42	22.03	00.000	1438.4	08.97						
12.3	O8S	00000	- 0.08	27.421	22.03		1438.4	08.97	0.00		0.00	00.0	000.	
12.3	O8S	00005	- 0.44	31.398	25.24		1442.3	09.99	0.16		0.00	00.0	006.	
	STO	00010	- 0.50	31.53	25.35	00.042	1442.3	09.57						
12.3	O8S	00010	- 0.50	31.533	25.35		1442.3	09.57	0.32		0.00	00.0	005.	
12.3	D8S	00015	- 0.72	31.714	25.51		1441.6	10.28	0.00		0.00	00.0	008.	
	STO	00020	- 0.76	31.74	25.53	00.068	1441.6	10.19						
12.3	D8S	00020	- 0.76	31.736	25.53		1441.6	10.19	0.00		0.00	00.0	016.	
12.3	O8S	00025	- 0.76	31.746	25.53		1441.7	10.10	0.14		0.00	00.0	006.	
12.3	O8S	00027	- 0.74	31.778	25.56		1441.8	10.08	0.52		0.20	00.0	023.	

N O D C S T A T I O N D A T A

REFID 31 2183	YEAR 1972	BOTDR 00164	AIR TEMP 02.2	DIR HGT PER	WIND-DIR 13	INST NANSEN CAST	TEN SQ 1617
CONSEC 0013	MONTH 07	SHIP SI	WET BULB 02.1		WIND-SPD 05	TRACE DIR	5 SQUARE 2
LAT 71 33 N	DAY 08	DATA USE 1	BAROMETR 1014.8	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 156 07 W	HOUR 08.5	AREA 10	CLOUD T/A 0/I	CL/TR	WEATHER X1	ORIG WBS 13A	1 SQUARE 16

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	01.09	25.76	20.66	00.000	1441.6	09.41						
08.5	OBS	00000	01.09	25.759	20.66		1441.6	09.41	0.17		0.00	00.0	000.	
08.5	OBS	00005	- 1.03	29.738	23.92		1437.3	09.68	0.17		0.13	00.0	005.	
	STD	00010	- 0.99	29.96	24.10	00.055	1437.8	09.70						
08.5	OBS	00010	- 0.99	29.959	24.10		1437.8	09.70	0.08		0.00	00.0	000.	
08.5	OBS	00015	- 0.95	30.000	24.13		1438.2	09.74	0.11		0.18	00.2	011.	
	STD	00020	- 1.07	30.25	24.34	00.092	1438.0	09.84						
08.5	OBS	00020	- 1.07	30.254	24.34		1438.0	09.84	0.64		0.10	00.0	000.	
08.5	OBS	00025	- 1.03	30.731	24.72		1439.0	09.66	0.48		0.12	00.0	000.	
	STD	00030	- 0.99	31.48	25.32	00.123	1440.3	09.82						
08.5	OBS	00030	- 0.99	31.478	25.32		1440.3	09.82	0.44		0.16	00.4	000.	
08.5	OBS	00035	- 0.70	32.097	25.82		1442.6	09.64	0.94		0.10	00.0	000.	
08.5	OBS	00040	- 0.56	32.472	26.11		1443.8	08.74	0.69		0.18	00.3	011.	
	STD	00050	- 0.99	32.81	26.40	00.166	1442.5	07.90						
08.5	OBS	00050	- 0.99	32.810	26.40		1442.5	07.90	1.04		0.32	09.5	022.	

N O D C S T A T I O N D A T A

REFID 31 2183	YEAR 1972	BOTDR 00044	AIR TEMP 03.3	DIR HGT PER	WIND-DIR 15	INST NANSEN CAST	TEN SQ 1617
CONSEC 0014	MONTH 07	SHIP SI	WET BULB 02.8		WIND-SPD 03	TRACE DIR	5 SQUARE 2
LAT 71 38 N	DAY 08	DATA USE 1	BAROMETR 1013.2	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 155 07 W	HOUR 15.6	AREA 10	CLOUD T/A /0	CL/TR	WEATHER X0	ORIG WBS 14A	1 SQUARE 15

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.83	13.81	11.09	00.000	1424.4	08.38						
15.6	OBS	00000	00.83	13.811	11.09		1424.4	08.38	0.00		0.07	00.0	000.	
15.6	OBS	00005	00.46	30.662	24.61		1445.5	09.46	0.48		0.08	00.0	000.	
	STD	00010	00.18	31.33	25.17	00.096	1445.2	09.77						
15.6	OBS	00010	00.18	31.332	25.17		1445.2	09.77	0.33		0.18	00.0	000.	
15.6	OBS	00015	00.27	31.584	25.36		1446.0	09.99	0.72		0.02	00.0	010.	
	STD	00020	02.23	31.87	25.47	00.123	1455.3	09.57						
15.6	OBS	00020	02.23	31.867	25.47		1455.3	09.57	0.67		0.00	00.0	009.	
15.6	OBS	00025	01.20	31.889	25.56		1450.8	09.62	0.67		0.04	00.0	000.	
	STD	00030	- 0.06	31.91	25.64	00.147	1445.2	09.57						
15.6	OBS	00030	- 0.06	31.907	25.64		1445.2	09.57	0.59		0.14	00.0	000.	
15.6	OBS	00035	00.43	32.264	25.90		1448.0	09.17	0.59		0.19	00.0	000.	
15.6	OBS	00040	00.53						0.00		0.00	00.0	000.	

N O D C S T A T I O N D A T A

REFID 31 2183	YEAR 1972	BOTDR 00054	AIR TEMP 05.0	DIR HGT PER	WIND-DIR 32	INST NANSEN CAST	TEN SQ 1617
CONSEC 0015	MONTH 07	SHIP SI	WET BULB 03.3		WIND-SPD 07	TRACE DIR	5 SQUARE 1
LAT 71 39 N	DAY 08	DATA USE 1	BAROMETR 1014.3	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 153 55 W	HOUR 19.3	AREA 10	CLOUD T/A /0	CL/TR	WEATHER X0	ORIG WBS 15A	1 SQUARE 13

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.34	18.68	15.00	00.000	1425.3	09.17						
19.3	OBS	00000	- 0.34	18.677	15.00		1425.3	09.17	0.00		0.01	00.0	000.	
19.3	OBS	00005	- 0.47	30.748	24.72		1441.3	09.92	0.22		0.13	00.0	000.	
	STD	00010	- 0.25	31.46	25.29	00.076	1443.4	10.15						
19.3	OBS	00010	- 0.25	31.459	25.29		1443.4	10.15	0.67		0.02	00.0	008.	
19.3	OBS	00015	- 0.26	31.655	25.44		1443.7	10.19	0.37		0.08	00.0	000.	
	STD	00020	- 0.33	31.82	25.58	00.102	1443.7	10.16						
19.3	OBS	00020	- 0.33	31.823	25.58		1443.7	10.16	0.44		0.11	00.0	000.	
19.3	OBS	00025	00.23	31.927	25.64		1446.5	09.94	0.48		0.17	00.1	000.	
	STD	00030	00.32	32.01	25.71	00.125	1447.1	10.00						
19.3	OBS	00030	00.32	32.014	25.71		1447.1	10.00	0.44		0.18	00.0	000.	
19.3	OBS	00035	00.86	32.176	25.81		1449.9	09.84	0.43		0.11	00.1	000.	

N O D C S T A T I O N D A T A

REFID 31 2183	YEAR 1972	BOTDR 00020	AIR TEMP 03.3	DIR HGT PER	WIND-DIR 27	INST NANSEN CAST	TEN SQ 1617
CONSEC 0016	MONTH 07	SHIP SI	WET BULB 02.8		WIND-SPD 04	TRACE DIR	5 SQUARE 1
LAT 71 07.5N	DAY 10	DATA USE 1	BAROMETR 1013.1	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 151 11.0W	HOUR 11.1	AREA 10	CLOUD T/A 0/4	CL/TR	WEATHER X1	ORIG WBS 16A	1 SQUARE 11

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 1.17	26.65	21.43	00.000	1432.2	09.06						
11.1	OBS	00000	- 1.17	26.646	21.43		1432.2	09.06	0.00		0.00	00.6	000.	
11.1	OBS	00005	- 1.32	32.017	25.77		1439.1	08.73	0.70		0.18	03.8	002.	
	STD	00010	- 1.29	32.31	26.01	00.042	1439.7	08.29						
11.1	OBS	00010	- 1.29	32.310	26.01		1439.7	08.29	1.02		0.19	06.0	005.	
11.1	OBS	00015	- 1.10	32.728	26.34		1441.3	07.67	1.09		0.16	13.7	016.	

N O D C S T A T I O N D A T A

REFIO 31 2183	YEAR 1972	BOTOP 00048	AIR TEMP 01.1	DIR HGT PER	WIND-DIR 10	INST NANSEN CAST	TEN SQ 1617
CONSEC 0017	MONTH 07	SHIP SI	WET BULB 01.0		WIND-SPD 05	TRACE DIR	5 SQUARE 1
LAT 71 07 N	DAY 11	DATA USE 1	BAROMETR 1016.4	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 23 W	HOUR 08.5	AREA 10	CLOUD T/A /0	CL/TR	WEATHER X0	ORIG WBS 17A	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.65	13.71	10.99	00.000	1417.2	09.08						
08.5	OBS	00000	- 0.65	13.707	10.99		1417.2	09.08	1.38		0.00	00.0	000.	
08.5	OBS	00005	- 1.49	31.304	25.20		1437.3	09.51	1.55		0.15	00.6	000.	
	STD	00010	- 1.47	31.65	25.48	00.095	1437.9	08.88						
08.5	OBS	00010	- 1.47	31.653	25.48		1437.9	08.88	1.22		0.04	02.2	015.	
08.5	OBS	00015	- 1.41	32.272	25.98		1439.2	07.63	1.05		0.19	14.0	018.	
	STD	00020	- 1.40	32.53	26.19	00.117	1439.7	07.19						
08.5	OBS	00020	- 1.40	32.533	26.19		1439.7	07.19	1.14		0.16	16.7	014.	
08.5	OBS	00025	- 1.41	32.729	26.35		1440.0	06.96	1.30		0.23	22.6	027.	
	STD	00030	- 0.34	32.92	26.47	00.134	1445.3	07.32						
08.5	OBS	00030	- 0.34	31.93 Q	25.67Q*			07.32	1.04		0.11	06.0	000.	
08.5	OBS	00035	- 0.32	33.104	26.61		1445.8	08.41	1.33		0.08	02.9	005.	
08.5	OBS	00040	- 0.33	31.71 Q	25.49Q*			08.46	1.47		0.03	04.1	009.	

N O D C S T A T I O N D A T A

REFIO 31 2183	YEAR 1972	BOTOP 00025	AIR TEMP 02.2	DIR HGT PER	WIND-DIR 08	INST NANSEN CAST	TEN SQ 1617
CONSEC 0018	MONTH 07	SHIP SI	WET BULB 01.7		WIND-SPD 04	TRACE DIR	5 SQUARE 1
LAT 70 56 N	DAY 12	DATA USE 1	BAROMETR 1008.6	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 22 W	HOUR 20.6	AREA 10	CLOUD T/A 0/8	CL/TR	WEATHER X2	ORIG WBS 18A	1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.06	06.49	05.18	00.000	1410.5	09.04						
20.6	OBS	00000	- 0.06	06.492	05.18		1410.5	09.04	0.00		0.05	00.0	000.	
20.6	OBS	00005	- 1.54	30.809	24.80		1436.3	09.07	0.65		0.09	00.0	000.	
	STD	00010	- 1.58	31.10	25.03	00.126	1436.6	09.11						
20.6	OBS	00010	- 1.58	31.099	25.03		1436.6	09.11	0.61		0.00	00.0	001.	
20.6	OBS	00015	- 1.43	32.333	26.03		1439.2	07.71	1.63		0.09	09.3	006.	
	STD	00020	- 1.43	32.45	26.12	00.150	1439.4	07.47						
20.6	OBS	00020	- 1.43	32.452	26.12		1439.4	07.47	1.44		0.06	09.6	008.	

N O D C S T A T I O N D A T A

REFIO 31 2183	YEAR 1972	BOTOP 00026	AIR TEMP 02.7	DIR HGT PER	WIND-DIR 00	INST NANSEN CAST	TEN SQ 1616
CONSEC 0019	MONTH 07	SHIP SI	WET BULB 02.2		WIND-SPD 00	TRACE DIR	5 SQUARE 2
LAT 70 33 N	DAY 16	DATA USE 1	BAROMETR 1012.0	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 45 W	HOUR 04.8	AREA 10	CLOUD T/A 3/2	CL/TR	WEATHER X1	ORIG WBS 19A	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.18	06.76	05.39	00.000	1410.3	09.02						
04.8	OBS	00000	- 0.18	06.762	05.39		1410.3	09.02	0.00		0.05	00.0	000.	
04.8	OBS	00005	- 1.58	30.522	24.56		1435.7	08.56	0.92		0.10	01.8	000.	
	STD	00010	- 1.61	30.57	24.61	00.127	1435.8	08.56						
04.8	OBS	00010	- 1.61	30.575	24.61		1435.8	08.56	0.79		0.09	01.5	000.	
04.8	OBS	00015	- 1.46	31.750	25.56		1438.2	07.81	1.52		0.07	06.8	009.	
	STD	00020	- 1.46	32.11	25.85	00.154	1438.8	07.08						
04.8	OBS	00020	- 1.46	32.107	25.85		1438.8	07.08	1.53		0.19	10.8	011.	

N O D C S T A T I O N D A T A

REFIO 31 2183	YEAR 1972	BOTOP 00026	AIR TEMP 02.2	DIR HGT PER	WIND-DIR 09	INST NANSEN CAST	TEN SQ 1616
CONSEC 0020	MONTH 07	SHIP SI	WET BULB 01.7		WIND-SPD 05	TRACE DIR	5 SQUARE 2
LAT 70 33 N	DAY 16	DATA USE 1	BAROMETR 1012.2	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 45 W	HOUR 07.8	AREA 10	CLOUD T/A 3/7	CL/TR	WEATHER X1	ORIG WBS 20A	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.04	06.18	04.93	00.000	1410.2	08.94						
07.8	OBS	00000	- 0.04	06.184	04.93		1410.2	08.94	0.00		0.22	00.0	000.	
07.8	OBS	00005	- 1.56	30.521	24.56		1435.8	08.51	1.86		0.17	01.1	000.	
	STD	00010	- 1.59	30.59	24.62	00.129	1435.9	08.56						
07.8	OBS	00010	- 1.59	30.593	24.62		1435.9	08.56	0.83		0.14	00.8	000.	
07.8	OBS	00015	- 1.44	31.678	25.50		1438.2	07.89	1.48		0.19	00.0		
	STD	00020	- 1.45	32.09	25.83	00.156	1438.8	08.09						
07.8	OBS	00020	- 1.45	32.094	25.83		1438.8	08.09	1.42		0.09	10.3	006.	

N O D C S T A T I O N D A T A

REFIO	31 2183	YEAR 1972	BOTOP 00026	AIR TEMP	02.2	DIR HGT PER	WIND-DIR 00	INST NANSEN CAST	TEN SQ 1616
CONSEC	0021	MONTH 07	SHIP SI	WET BULB	01.7		WIND-SPD 00	TRACE DIR	S SQUARE 2
LAT	70 33 N	DAY 16	DATA USE 1	BAROMETR	1012.5	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG	147 45 W	HOUR 08.9	AREA 10	CLOUD T/A	3/6	CL/TR	WEATHER X1	ORIG WBS 21A	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	ND2	NO3	SIO3	PH
	STO	00000	00.05	05.26	04.18	00.000	1409.5	08.94						
08.9	OBS	00000	00.05	05.260	04.18		1409.5	08.94	0.00		0.21	00.0	000.	
08.9	OBS	00005	- 1.57	30.482	24.53		1435.7	08.44	0.77		0.20	01.9	000.	
	STO	00010	- 1.60	30.57	24.61	00.133	1435.8	08.59						
08.9	OBS	00010	- 1.60	30.572	24.61		1435.8	08.59	1.73		0.23	02.2	000.	
08.9	OBS	00015	- 1.46	31.805	25.60		1438.3	07.72	1.66		0.14	08.7	014.	
	STO	00020	- 1.45	32.07	25.81	00.160	1438.8	07.14						
08.9	OBS	00020	- 1.45	32.068	25.81		1438.8	07.14	1.36		0.14	11.2	016.	

N O D C S T A T I O N D A T A

REFIO	31 2183	YEAR 1972	BOTOP 00026	AIR TEMP	02.1	DIR HGT PER	WIND-DIR 00	INST NANSEN CAST	TEN SQ 1616
CONSEC	0022	MONTH 07	SHIP SI	WET BULB	01.5		WIND-SPD 00	TRACE DIR	S SQUARE 2
LAT	70 33 N	DAY 16	DATA USE 1	BAROMETR	1013.2	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG	147 45 W	HOUR 11.1	AREA 10	CLOUD T/A	5/6	CL/TR	WEATHER X1	ORIG WBS 22A	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	ND2	NO3	SIO3	PH
	STO	00000	00.08	04.98	03.96	00.000	1409.3	08.96						
11.1	OBS	00000	00.08	04.985	03.96		1409.3	08.96	0.00		0.20	00.0	000.	
11.1	OBS	00005	- 1.57	30.404	24.47		1435.6	08.47	0.69		0.09	01.8	000.	
	STO	00010	- 1.59	30.58	24.61	00.134	1435.9	08.47						
11.1	OBS	00010	- 1.59	30.579	24.61		1435.9	08.47	1.04		0.19	01.9	000.	
11.1	OBS	00015	- 1.46	31.785	25.58		1438.3	07.68	1.38		0.04	07.7	010.	
	STO	00020	- 1.45	32.09	25.83	00.161	1438.8	07.06						
11.1	OBS	00020	- 1.45	32.093	25.83		1438.8	07.06	1.53		0.16	11.7	018.	

N O D C S T A T I O N D A T A

REFIO	31 2183	YEAR 1972	BOTOP 00026	AIR TEMP	02.2	DIR HGT PER	WIND-DIR 00	INST NANSEN CAST	TEN SQ 1616
CONSEC	0023	MONTH 07	SHIP SI	WET BULB	01.7		WIND-SPD 00	TRACE DIR	S SQUARE 2
LAT	70 33 N	DAY 16	DATA USE 1	BAROMETR	1013.0	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG	147 45 W	HOUR 13.1	AREA 10	CLOUD T/A	5/7	CL/TR	WEATHER X1	ORIG WBS 23A	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	ND2	NO3	SIO3	PH
	STO	00000	00.15	05.93	04.73	00.000	1410.8	09.01						
13.1	OBS	00000	00.15	05.926	04.73		1410.8	09.01	0.00		0.26	00.0	000.	
13.1	OBS	00005	- 1.58	30.415	24.48		1435.6	08.48	0.56		0.18	01.1	000.	
	STO	00010	- 1.59	30.58	24.61	00.130	1435.9	08.76						
13.1	OBS	00010	- 1.59	30.582	24.61		1435.9	08.76	0.71		0.07	01.7	000.	
13.1	OBS	00015	- 1.46	31.796	25.59		1438.3	07.71	0.77		0.12	08.5	025.	
	STO	00020	- 1.46	32.07	25.81	00.158	1438.7	07.06						
13.1	OBS	00020	- 1.46	32.067	25.81		1438.7	07.06	1.48		0.03	09.7	005.	

N O O C S T A T I O N D A T A

A R C H I V E L I S T I N G

REFID	31 8328	YEAR	1972	BOTOP	00485	AIR TEMP	05.6	DIR HGT PER		WIND-DIR	19	INST STD RECORDER		TEN SQ	1616
CONSEC	0001	MONTH	08	SHIP GL		WET BULB	04.7	04 2	3	WIND-SPD	03	TRACE DIR		5 SQUARE	1
LAT	70 45 N	DAY	05	DATA USE	1	BAROMETR	0999.6	SEA		WIND-FOR		DURATION		2 SQUARE	02
LONG	143 31 W	HOUR	09.1	AREA	10	CLOUD T/A		CL/TR		WEATHER	X1	ORIG WBS	004	1 SQUARE	03

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	04.72	25.77	20.43	00.000	1457.6							
09.1	OBS	00000	04.72	25.770	20.43		1457.6							
	OBS	00009	02.00	28.000	22.40		1448.9							
	STD	00010	00.75	28.76	23.08	00.061	1444.3							
	OBS	00011	- 0.25	29.390	23.62		1440.5							
	OBS	00017	- 1.20	30.410	24.47		1437.6							
	STD	00020	- 1.15	30.57	24.60	00.101	1438.1							
	OBS	00020	- 1.15	30.570	24.60		1438.1							
	OBS	00029	- 1.48	30.810	24.80		1437.0							
	STD	00030	- 1.47	30.88	24.85	00.134	1437.2							
	STD	00050	- 1.30	32.02	25.77	00.187	1439.9							
	OBS	00052	- 1.30	32.100	25.84		1440.1							
	STD	00075	- 1.45	32.60	26.25	00.237	1440.4							
	OBS	00079	- 1.47	32.670	26.30		1440.5							
	STD	00100	- 1.48	32.88	26.47	00.279	1441.1							
	OBS	00121	- 1.49	33.060	26.62		1441.7							
	STD	00125	- 1.40	33.09	26.64	00.316	1442.2							
	OBS	00126	- 1.39	33.100	26.65		1442.3							
	OBS	00132	- 1.47	33.180	26.71		1442.1							
	OBS	00136	- 1.47	33.240	26.76		1442.3							
	OBS	00143	- 1.10	33.300	26.80		1444.2							
	OBS	00148	- 1.22	33.390	26.88		1443.8							
	STD	00150	- 1.01	33.39	26.87	00.348	1444.8							
	OBS	00155	- 1.00	33.400	26.88		1445.0							
	OBS	00158	- 1.34	33.400	26.89		1443.5							
	OBS	00160	- 1.26	33.440	26.92		1443.9							
	OBS	00167	- 1.34	33.500	26.97		1443.7							
	OBS	00196	- 1.09	33.710	27.13		1445.7							
	STD	00200	- 0.99	33.84	27.23	00.399	1446.4							
	OBS	00232	- 0.35	34.570	27.80		1450.9							
	STD	00250	- 0.17	34.67	27.87	00.426	1452.2							
	OBS	00277	00.06	34.790	27.95		1453.9							
	STD	00300	00.18	34.83	27.98	00.435	1454.9							
	OBS	00346	00.36	34.890	28.02		1456.5							
	STD	00400	00.41	34.94	28.05	00.446	1457.7							
	OBS	00440	00.45	34.950	28.06		1458.6							

N O O C S T A T I O N D A T A

REFID	31 8328	YEAR	1972	BOTOP	00925	AIR TEMP	05.0	DIR HGT PER		WIND-DIR	00	INST STD RECORDER		TEN SQ	1616
CONSEC	0002	MONTH	08	SHIP GL		WET BULB	04.4			WIND-SPD	00	TRACE DIR		5 SQUARE	1
LAT	70 51.7N	DAY	05	DATA USE	1	BAROMETR	0998.2	SEA		WIND-FOR		DURATION		2 SQUARE	02
LONG	143 45.4W	HOUR	23.1	AREA	10	CLOUD T/A		CL/TR		WEATHER	X1	ORIG WBS	005	1 SQUARE	03

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	05.44	21.30	16.85	00.000	1454.8							
23.1	OBS	00000	05.44	21.300	16.85		1454.8							
	STD	00010	01.00	26.34	21.13	00.087	1442.1							
	OBS	00010	01.00											
	OBS	00014	- 1.15											
	STD	00020	- 1.36	29.66	23.86	00.141	1435.9							
	OBS	00024	- 1.45	30.500	24.54		1436.6							
	STD	00030	- 1.46	30.51	24.55	00.178	1436.7							
	OBS	00041	- 1.47	31.000	24.95		1437.5							
	OBS	00049	- 1.30	31.750	25.55		1439.5							
	STD	00050	- 1.31	31.79	25.59	00.236	1439.5							
	OBS	00073	- 1.44	32.530	26.19		1440.3							
	STD	00075	- 1.40	32.60	26.24	00.288	1440.7							
	OBS	00082	- 1.39	32.720	26.34		1441.0							
	OBS	00085	- 1.44	32.720	26.34		1440.8							
	OBS	00089	- 1.28	32.780	26.39		1441.7							
	OBS	00092	- 1.45	32.730	26.35 *		1440.9							
	OBS	00099	- 1.29	32.900	26.48		1442.0							
	STD	00100	- 1.36	32.90	26.48	00.330	1441.7							
	OBS	00102	- 1.46	32.900	26.49		1441.3							
	OBS	00112	- 0.94	33.120	26.65		1444.2							
	OBS	00114	- 1.04	33.130	26.66		1443.8							
	OBS	00121	- 0.82	33.140	26.66		1444.9							
	STD	00125	- 0.87	33.14	26.67	00.367	1444.7							
	STD	00150	- 1.06	33.22	26.74	00.400	1444.4							
	OBS	00157	- 1.07	33.260	26.77		1444.5							
	OBS	00171	- 1.04	33.360	26.85		1445.0							
	OBS	00187	01.28	33.500	26.84		1456.1							
	STD	00200	00.96	33.76	27.08	00.458	1455.2							
	STD	00250	00.08	34.55	27.76	00.491	1453.2							
	OBS	00262	- 0.05	34.690	27.88		1453.0							
	STD	00300	00.14	34.77	27.93	00.504	1454.6							
	OBS	00385	00.41	34.890	28.01		1457.4							
	STD	00400	00.43	34.90	28.02	00.519	1457.7							
	OBS	00462	00.47	34.920	28.04		1459.0							
	STD	00500	00.43	34.93	28.05	00.528	1459.4							
	STD	00600	00.32	34.96	28.08	00.535	1460.7							
	STD	00700	00.21	34.98	28.10	00.538	1461.9							
	OBS	00734	00.17	34.990	28.11		1462.3							

N O D E S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BDTDP 00513	AIR TEMP 03.3	DIR HGT PER	WIND-DIR 31	INST STD RECORDER	TEN SQ 1616
CONSEC 0003	MONTH 08	SHIP GL	WET BULB 03.1		WIND-SPD 04	TRACE DIR	5 SQUARE 1
LAT 70 51.9N	DAY 06	DATA USE 1	BAROMETR 1000.5	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 144 31.8W	HOUR 14.2	AREA 10	CLOUD T/A	CL/TR	WEATHER X1	ORIG WBS 006	1 SQUARE 04

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	05.44	24.30	19.21	00.000	1458.7							
14.2	OBS	00000	05.44	24.300	19.21		1458.7							
	OBS	00005	00.97	25.000	20.05		1440.1							
	OBS	00009	- 1.07	29.500	23.73		1436.8							
	STD	00010	- 1.05	29.64	23.84	00.063	1437.1							
	OBS	00012	- 1.01	29.900	24.05		1437.7							
	STD	00020	- 1.24	30.23	24.32	00.101	1437.2							
	OBS	00028	- 1.40	30.500	24.54		1436.9							
	STD	00030	- 1.41	30.55	24.58	00.136	1437.0							
	OBS	00043	- 1.48	30.870	24.84		1437.3							
	OBS	00049	- 0.97	31.470	25.32		1440.7							
	STD	00050	- 1.13	31.50	25.35	00.196	1440.0							
	OBS	00052	- 1.34	31.600	25.43		1439.2							
	OBS	00057	- 1.29	32.020	25.77		1440.1							
	OBS	00069	- 1.35	32.490	26.15		1440.7							
	OBS	00071	- 1.23	32.500	26.16		1441.3							
	STD	00075	- 1.39	32.50	26.16	00.252	1440.6							
	OBS	00076	- 1.40	32.500	26.16		1440.5							
	OBS	00082	- 1.24	32.600	26.24		1441.5							
	OBS	00085	- 1.43	32.620	26.26		1440.7							
	OBS	00089	- 1.30	32.750	26.36		1441.6							
	OBS	00092	- 1.35	32.760	26.37		1441.4							
	STD	00100	- 1.32	32.88	26.47	00.295	1441.9							
	OBS	00104	- 1.30	32.910	26.49		1442.1							
	OBS	00106	- 1.13	32.920	26.49		1442.9							
	OBS	00108	- 1.31	32.930	26.51		1442.1							
	OBS	00121	- 1.32	33.120	26.66		1442.5							
	STD	00125	- 1.10	33.13	26.66	00.332	1443.6							
	OBS	00128	- 1.06	33.150	26.68		1443.9							
	OBS	00135	- 1.38	33.260	26.78		1442.7							
	OB	00143	- 1.08	33.350	26.84		1444.4							
	STD	00150	- 1.16	33.45	26.92	00.363	1444.3							
	OBS	00156	- 1.22	33.490	26.96		1444.1							
	OBS	00161	- 1.04	33.500	26.96		1445.0							
	OBS	00169	- 1.29	33.510	26.98		1444.0							
	STD	00200	- 0.72	34.08	27.42	00.408	1448.0							
	STD	00250	- 0.05	34.71	27.90	00.430	1452.8							
	OBS	00257	00.02	34.770	27.94		1453.3							
	STD	00300	00.24	34.84	27.98	00.439	1455.1							
	OBS	00347	00.39	34.900	28.02		1456.7							
	STD	00400	00.43	34.94	28.06	00.449	1457.8							
	OBS	00429	00.45	34.960	28.07		1458.4							
	STD	00500	00.28	34.99	28.10	00.454	1458.9							
	OBS	00506	00.26	34.990	28.10		1458.9							

N O O C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00311	AIR TEMP 06.7	DIR HGT PER	WIND-DIR 15	INST STD RECORDER	TEN SQ 1616
CONSEC 0004	MONTH 08	SHIP GL	WET BULB 06.1		WIND-SPD 04	TRACE DIR	5 SQUARE 1
LAT 70 43 N	DAY 06	DATA USE 1	BAROMETR 1002.0	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 144 32 W	HOUR 23.0	AREA 10	CLOUD T/A	CL/TR	WEATHER X1	ORIG WBS 007	1 SQUARE 04

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	05.66	26.41	20.85	00.000	1462.4							
23.0	OBS	00000	05.66	26.410	20.85		1462.4							
	OBS	00004	00.11											
	OBS	00007	- 0.76											
	STD	00010	- 0.94	28.99	23.31	00.058	1436.7							
	STD	00020	- 1.35	30.53	24.56	00.097	1437.1							
	OBS	00024	- 1.43	30.850	24.83		1437.2							
	STD	00030	- 1.44	30.90	24.87	00.130	1437.3							
	OBS	00032	- 1.45	31.000	24.95		1437.5							
	OBS	00036	- 0.64	31.340	25.20		1441.8							
	OBS	00041	- 1.29	31.870	25.65		1439.6							
	OBS	00046	- 1.29	32.250	25.96		1440.2							
	OBS	00047	- 1.19	32.250	25.95		1440.7							
	OBS	00049	- 1.31	32.260	25.97		1440.2							
	STD	00050	- 1.29	32.31	26.01	00.181	1440.4							
	OBS	00052	- 1.27	32.400	26.08		1440.6							
	OBS	00055	- 1.33	32.490	26.15		1440.5							
	OBS	00067	- 1.29	32.680	26.30		1441.2							
	OBS	00070	- 1.34	32.750	26.36		1441.1							
	STD	00075	- 1.24	32.81	26.41	00.226	1441.7							
	OBS	00082	- 1.20	32.870	26.46		1442.1							
	OBS	00085	- 1.22	32.890	26.47		1442.1							
	OBS	00097	- 1.14	32.970	26.54		1442.8							
	STD	00100	- 1.19	32.97	26.54	00.265	1442.6							
	OBS	00103	- 1.22	32.980	26.55		1442.5							
	OBS	00116	- 1.18	33.060	26.61		1443.0							
	STD	00125	- 1.22	33.10	26.64	00.301	1443.1							
	OBS	00131	- 1.24	33.120	26.66		1443.1							
	OBS	00139	- 1.13	33.140	26.67		1443.8							
	OBS	00148	- 1.36	33.200	26.73		1442.9							
	STD	00150	- 1.34	33.21	26.74	00.335	1443.1							
	OBS	00161	- 1.29	33.250	26.77		1443.5							
	OBS	00175	- 1.38	33.250	26.77		1443.3							
	STD	00200	- 1.15	33.42	26.90	00.397	1445.1							
	OBS	00202	- 1.15	33.450	26.92		1445.1							
	OBS	00218	- 1.21	33.820	27.22		1445.6							
	STD	00250	- 0.92	34.39	27.68	00.436	1448.3							
	OBS	00291	00.25	34.800	27.95		1455.0							

N O O C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00128	AIR TEMP 06.1	DIR HGT PER	WIND-DIR 26	INST STD RECORDER	TEN SQ 1616
CONSEC 0005	MONTH 08	SHIP GL	WET BULB 05.1	26 1 2	WIND-SPD 09	TRACE DIR	5 SQUARE 1
LAT 70 38.8N	DAY 07	DATA USE 1	BAROMETR 1004.5	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 144 33.0W	HOUR 09.0	AREA 10	CLOUD T/A	CL/TR	WEATHER X1	ORIG WBS 008	1 SQUARE 04

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.21	29.00	23.11	00.000	1455.4							
09.0	OBS	00000	03.21	29.000	23.11		1455.4							
	OBS	00002	02.92											
	OBS	00003	03.12											
	OBS	00007	01.75											
	STD	00010	00.05	29.87	24.00	00.043	1442.6							
	OBS	00015	- 1.08	30.610	24.63		1438.4							
	OBS	00017	- 0.93	30.960	24.90		1439.6							
	OBS	00018	- 1.14	30.980	24.93		1438.7							
	STD	00020	- 0.68	31.07	24.99	00.078	1441.0							
	OBS	00020	- 0.68	31.070	24.99		1441.0							
	OBS	00022	- 1.12	31.080	25.01		1439.0							
	OBS	00025	- 0.30	31.300	25.16		1443.2							
	STD	00030	- 1.05	31.54	25.38	00.106	1440.1							
	OBS	00032	- 1.27	31.640	25.46		1439.2							
	OBS	00047	- 1.33	32.360	26.05		1440.2							
	OBS	00049	- 1.23	32.370	26.05		1440.7							
	STD	00050	- 1.27	32.40	26.08	00.151	1440.6							
	OBS	00053	- 1.37	32.500	26.16		1440.3							
	STD	00075	- 1.37	32.68	26.31	00.197	1440.9							
	OBS	00091	- 1.37	32.800	26.40		1441.4							
	STD	00100	- 1.33	32.86	26.45	00.238	1441.8							
	OBS	00118	- 1.20	32.960	26.53		1442.8							

N O O C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 01061	AIR TEMP	DIR HGT PER	WIND-DIR 12	INST STD RECORDER	TEN SQ 1616
CONSEC 0006	MONTH 08	SHIP GL	WET BULB		WIND-SPD 04	TRACE DIR	5 SQUARE 2
LAT 71 02.2N	DAY 10	DATA USE 1	BAROMETR 1014.2	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 145 32.0W	HOUR 10.9	AREA 10	CLOUD T/A	CL/TR	WEATHER X2	ORIG #BS 018	1 SQUARE 15

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.86	23.75	19.09	00.000	1429.7							
10.9	OBS	00000	- 0.86	23.750	19.09		1429.7							
	OBS	00007	- 0.21	25.000	20.09		1434.6							
	STD	00010	- 0.59	26.57	21.36	00.075	1435.0							
	OBS	00018	- 1.17	29.250	23.53		1436.1							
	STD	00020	- 1.17	29.44	23.68	00.129	1436.4							
	OBS	00025	- 1.16	29.780	23.96		1437.0							
	STD	00030	- 1.31	29.78	23.96	00.170	1436.4							
	OBS	00040	- 1.44	29.770	23.95		1435.9							
	STD	00050	- 1.33	31.61	25.44	00.235	1439.2							
	OBS	00051	- 1.32	31.750	25.55		1439.5							
	OBS	00073	- 1.44	32.500	26.16		1440.3							
	STD	00075	- 1.44	32.55	26.21	00.289	1440.4							
	OBS	00095	- 1.47	32.860	26.46		1441.0							
	STD	00100	- 1.23	32.87	26.46	00.331	1442.3							
	OBS	00101	- 1.18	32.870	26.46		1442.5							
	OBS	00102	- 1.40	32.870	26.46		1441.5							
	OBS	00106	- 1.33	32.970	26.54		1442.0							
	OBS	00113	- 1.44	33.000	26.57		1441.7							
	OBS	00119	- 1.10	33.080	26.62		1443.5							
	OBS	00122	- 1.19	33.100	26.64		1443.1							
	STD	00125	- 1.17	33.15	26.68	00.368	1443.3							
	OBS	00132	- 1.14	33.230	26.75		1443.7							
	OBS	00139	- 1.40	33.250	26.77		1442.6							
	STD	00150	- 1.23	33.38	26.87	00.400	1443.8							
	OBS	00152	- 1.20	33.400	26.88		1444.0							
	OBS	00157	- 1.38	33.460	26.94		1443.3							
	OBS	00173	- 1.11	33.620	27.06		1445.1							
	OBS	00175	- 1.18	33.630	27.07		1444.8							
	OBS	00197	- 1.03	34.010	27.37		1446.4							
	STD	00200	- 0.95	34.00	27.37	00.447	1446.8							
	OBS	00232	- 0.23	34.000	27.33		1450.7							
	STD	00250	- 0.11	34.18	27.47	00.481	1451.8							
	STD	00300	00.18	34.59	27.79	00.504	1454.5							
	OBS	00357	00.40	34.890	28.02		1456.9							
	STD	00400	00.45	34.91	28.03	00.525	1457.9							
	OBS	00477	00.50	34.940	28.05		1459.4							
	STD	00500	00.46	34.94	28.06	00.533	1459.6							
	STD	00600	00.32	34.96	28.08	00.540	1460.6							
	STD	00700	00.19	34.97	28.10	00.544	1461.7							
	OBS	00755	00.12	34.980	28.10		1462.4							
	STD	00800	00.08	34.98	28.11	00.546	1462.9							
	STD	00900	- 0.03	34.99	28.12	00.548	1464.1							
	OBS	00919	- 0.05	34.990	28.12		1464.4							
	STD	01000	- 0.14	35.00	28.13	00.547	1465.3							
	OBS	01029	- 0.18	35.000	28.14		1465.6							

N O D C S T A T I O N D A T A

REFIO	31 8328	YEAR 1972	BOTOP 01846	AIR TEMP	02.2	DIR HGT PER	WIND-DIR 25	INST STD RECORDER	TEN SQ 1616
CONSEC	0007	MONTH 08	SHIP GL	WET BULB	02.2		WIND-SPD 07	TRACE DIR	5 SQUARE 2
LAT	71 09 N	DAY 11	DATA USE 1	BAROMETR	1008.0	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG	146 29 W	HOUR 12.4	AREA 10	CLOUD T/A		CL/TP	WEATHER X6	ORIG WBS 019	1 SQUARE 16

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	- 0.72											
12.4	OBS	00000	- 0.72											
	STO	00010	- 1.17											
	STO	00020	- 1.40											
	OBS	00029	- 1.42	31.000	24.95		1437.6							
	STO	00030	- 1.39	31.19	25.10		1438.0							
	OBS	00038	- 1.26	32.370	26.05		1440.4							
	STO	00050	- 1.35	32.62	26.25		1440.5							
	OBS	00056	- 1.40	32.650	26.28		1440.4							
	OBS	00057	- 1.36	32.650	26.28		1440.6							
	OBS	00062	- 1.40	32.740	26.36		1440.7							
	OBS	00065	- 0.97	32.800	26.39		1442.8							
	OBS	00073	- 1.33	32.870	26.46		1441.3							
	STO	00075	- 1.15	32.94	26.51		1442.3							
	OBS	00077	- 1.02	33.000	26.56		1443.0							
	OBS	00088	- 1.32	33.000	26.56		1441.8							
	STO	00100	- 1.24	33.06	26.61		1442.5							
	OBS	00103	- 1.10	33.080	26.62		1443.2							
	OBS	00109	- 0.68	33.120	26.64		1445.3							
	OBS	00111	- 0.77	33.200	26.71		1445.1							
	STO	00125	- 0.61	33.21	26.71		1446.0							
	OBS	00127	- 0.59	33.210	26.71		1446.2							
	OBS	00132	- 0.71	33.210	26.71		1445.7							
	STO	00150	- 0.55	33.22	26.72		1446.8							
	OBS	00157	- 0.50	33.230	26.72		1447.1							
	OBS	00186	- 0.42	33.270	26.75		1448.0							
	OBS	00188	- 0.57	33.270	26.76		1447.4							
	STO	00200	- 0.56	33.27	26.76		1447.6							
	OBS	00207	- 0.56	33.270	26.76		1447.7							
	STO	00250	- 0.20	33.74	27.12		1450.7							
	OBS	00251	- 0.20	33.750	27.13		1450.8							
	OBS	00297	- 0.15	34.90 P	28.05Q									
	STO	00300	- 0.13	34.23	27.51 *		1452.6							
	STO	00400	00.41	34.87	28.00		1457.6							
	OBS	00407	00.43	34.900	28.02		1457.9							
	STO	00500	00.44	34.94	28.05		1459.5							
	OBS	00557	00.44	34.950	28.06		1460.5							
	STO	00600	00.38	34.95	28.07		1460.9							
	STO	00700	00.24	34.95	28.07		1462.0							
	OBS	00752	00.18	34.950	28.08		1462.5							
	STO	00800	00.12	34.95	28.08		1463.1							
	STO	00900	00.02	34.95	28.09		1464.3							
	STO	01000	- 0.08	34.95	28.09		1465.5							
	OBS	01092	- 0.15	34.950	28.09		1466.8							
	OBS	01532	- 0.36	34.950	28.10		1473.2							

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 01149	AIR TEMP	DIR HGT PER	WIND-DIR 00	INST STD RECORDER	TEN SQ 1616
CONSEC 000B	MONTH 08	SHIP GL	WET BULB		WIND-SPD 00	TRACE DIR	5 SQUARE 2
LAT 71 03 N	DAY 12	DATA USE 1	BARDMETR 1014.1	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 146 29 W	HOUR 12.7	AREA 10	CLOUD T/A	CL/TR	WEATHER X0	ORIG WBS 020	1 SQUARE 16

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.85	27.25	21.91	00.000	1434.6							
12.7	OBS	00000	- 0.85											
	OBS	00007	- 1.02	27.250	21.91		1433.9							
	OBS	00008	- 0.94	27.300	21.95		1434.4							
	STD	00010	- 0.98	27.60	22.19	00.058	1434.6							
	STD	00020	- 1.19	28.98	23.32	00.109	1435.7							
	STD	00030	- 1.40	30.22	24.32	00.150	1436.6							
	OBS	00032	- 1.44	30.450	24.50		1436.8							
	OBS	00045	- 1.17	31.790	25.58		1440.1							
	STD	00050	- 1.29	32.04	25.79	00.208	1440.0							
	OBS	00052	- 1.32	32.120	25.85		1440.0							
	OBS	00064	- 1.36	32.380	26.06		1440.4							
	OBS	00071	- 1.22	32.500	26.16		1441.3							
	OBS	00073	- 1.43	32.500	26.16		1440.4							
	STD	00075	- 1.29	32.51	26.16	00.259	1441.1							
	OBS	00077	- 1.26	32.520	26.17		1441.3							
	OBS	00080	- 1.43	32.560	26.21		1440.6							
	OBS	00083	- 1.31	32.680	26.31		1441.3							
	OBS	00088	- 1.47	32.700	26.33		1440.7							
	OBS	00098	- 1.11	32.800	26.40		1442.7							
	STD	00100	- 1.22	32.81	26.40	00.303	1442.2							
	OBS	00103	- 1.34	32.820	26.42		1441.7							
	OBS	00118	- 1.22	32.970	26.54		1442.7							
	STD	00125	- 1.35	33.00	26.56	00.341	1442.3							
	OBS	00126	- 1.37	33.000	26.57		1442.2							
	OBS	00136	- 1.03	33.060	26.60		1444.1							
	OBS	00139	- 1.35	33.100	26.65		1442.7							
	OBS	00143	- 0.86	33.110	26.64		1445.0							
	STD	00150	- 1.34	33.13	26.67	00.377	1442.9							
	OBS	00150	- 1.34	33.130	26.67		1442.9							
	OBS	00158	- 0.83	33.200	26.71		1445.6							
	OBS	00166	- 1.14	33.210	26.73		1444.3							
	OBS	00175	- 0.95	33.260	26.76		1445.4							
	OBS	00185	- 1.33	33.300	26.81		1443.8							
	STD	00200	- 1.12	33.47	26.94	00.439	1445.3							
	OBS	00202	- 1.12	33.500	26.96		1445.4							
	OBS	00214	- 1.23	33.670	27.10		1445.3							
	STD	00250	- 0.54	34.34	27.62	00.479	1450.0							
	OBS	00262	- 0.35	34.500	27.74		1451.3							
	STD	00300	- 0.01	34.68	27.87	00.497	1453.8							
	OBS	00347	00.30	34.850	27.99		1456.2							
	STD	00400	00.39	34.88	28.01	00.514	1457.5							
	OBS	00492	00.47	34.920	28.04		1459.5							
	STD	00500	00.46	34.92	28.04	00.525	1459.6							
	STD	00600	00.33	34.94	28.06	00.532	1460.7							
	STD	00700	00.21	34.96	28.08	00.538	1461.8							
	OBS	00753	00.15	34.970	28.09		1462.5							
	STD	00800	00.10	34.97	28.10	00.541	1463.0							
	STD	00900	- 0.00	34.98	28.11	00.544	1464.2							
	STD	01000	- 0.09	34.98	28.12	00.545	1465.5							
	STD	01100	- 0.17	34.99	28.13	00.545	1466.9							
	OBS	01139	- 0.20	34.990	28.13		1467.4							

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00135	AIR TEMP 00.9	DIR HGT PER	WIND-DIR 31	INST STD RECORDER	TEN SQ 1616
CONSEC 0009	MONTH 08	SHIP GL	WET BULB 00.9		WIND-SPD 02	TRACE DIR	5 SQUARE 2
LAT 71 02 N	DAY 15	DATA USE 1	BARDMETR 1003.3	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 30 W	HOUR 23.8	AREA 10	CLOUD T/A	CL/TR	WEATHER X4	ORIG WBS 031	1 SQUARE 17

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 1.03	28.68	23.07	00.000	1435.7							
23.8	OBS	00002	- 1.03											
	OBS	00007	- 1.23	28.680	23.07		1434.9							
	STD	00010	- 1.22	29.44	23.68	00.045	1436.0							
	OBS	00011	- 1.22	29.610	23.82		1436.3							
	OBS	00015	- 1.32	29.870	24.03		1436.2							
	STD	00020	- 1.31	30.28	24.36	00.084	1436.9							
	OBS	00020	- 1.31	30.280	24.36		1436.9							
	OBS	00023	- 1.43	30.460	24.51		1436.7							
	STD	00030	- 1.34	30.86	24.83	00.118	1437.8							
	OBS	00032	- 1.31	30.960	24.91		1438.1							
	OBS	00034	- 1.38	31.060	25.00		1437.9							
	OBS	00043	- 1.22	31.710	25.52		1439.7							
	OBS	00047	00.19	32.22 P	25.880									
	STD	00050	00.19	31.85	25.58 *	00.173	1446.6							
	OBS	00066	00.18	32.060	25.75		1447.1							
	STD	00075	00.06	32.12	25.81	00.231	1446.8							
	OBS	00083	- 0.11	32.140	25.83		1446.2							

N O D C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTOP 01086	AIR TEMP 00.8	OIR HGT PER	WIND-OIR 21	INST STO RECORDER	TEN SQ 1616
CONSEC 0010	MONTH 08	SHIP GL	WET BULB 00.6		WIND-SPD 09	TRACE OIR	5 SQUARE 2
LAT 71 05 N	DAY 16	DATA USE 1	BAROMETR 1010.1	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 35 W	HOUR 23.5	AREA 10	CLOUD T/A	CL/TR	WEATHER X2	ORIG WBS 033	1 SQUARE 17

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	- 1.22	29.12	23.43	00.000	1435.4							
23.5	OBS	00001	- 1.22											
	OBS	00002	- 1.28											
	OBS	00007	- 1.26	29.120	23.43		1435.3							
	STO	00010	- 1.26	29.38	23.63	00.044	1435.7							
	OBS	00011	- 1.26	29.500	23.73		1435.9							
	OBS	00013	- 1.39	29.810	23.99		1435.8							
	OBS	00019	- 1.33	30.470	24.52		1437.1							
	STO	00020	- 1.34	30.53	24.57	00.082	1437.1							
	OBS	00023	- 1.39	30.750	24.75		1437.3							
	STO	00030	01.28	31.53	25.27	00.112	1450.8							
	OBS	00032	02.04	31.610	25.28		1454.3							
	OBS	00035	00.67	31.610	25.36		1448.2							
	OBS	00043	00.90	31.800	25.50		1449.7							
	STO	00050	00.28	31.89	25.61	00.163	1447.1							
	OBS	00063	- 0.04	32.090	25.78		1446.1							
	OBS	00067	00.08	32.160	25.84		1446.8							
	STO	00075	- 0.33	32.20	25.89	00.220	1445.1							
	OBS	00075	- 0.33	32.200	25.89		1445.1							
	OBS	00077	- 0.23	32.290	25.95		1445.7							
	STO	00100	- 0.91	32.50	26.15	00.270	1443.2							
	OBS	00101	- 0.94	32.500	26.15		1443.1							
	OBS	00105	- 0.77	32.510	26.15		1444.0							
	OBS	00124	- 1.18	32.650	26.28		1442.6							
	STO	00125	- 1.15	32.66	26.28	00.315	1442.7							
	OBS	00132	- 1.01	32.690	26.30		1443.6							
	STO	00150	- 1.25	32.74	26.35	00.357	1442.8							
	OBS	00161	- 1.40	32.770	26.38		1442.3							
	OBS	00167	- 1.16	32.900	26.48		1443.7							
	OBS	00176	- 1.43	33.310	26.82		1443.2							
	OBS	00185	- 1.20	33.460	26.93		1444.6							
	OBS	00190	- 1.24	33.520	26.98		1444.6							
	STO	00200	- 1.02	33.75	27.17	00.422	1446.2							
	STO	00250	- 0.16	34.59	27.80	00.452	1452.1							
	OBS	00251	- 0.15	34.600	27.81		1452.2							
	STO	00300	00.21	34.78	27.93	00.464	1454.9							
	OBS	00317	00.30	34.820	27.96		1455.7							
	STO	00400	00.44	34.89	28.01	00.479	1457.8							
	OBS	00413	00.45	34.900	28.02		1458.0							
	STO	00500	00.36	34.91	28.04	00.489	1459.1							
	STO	00600	00.26	34.93	28.05	00.497	1460.3							
	STO	00700	00.16	34.94	28.07	00.503	1461.6							
	OBS	00755	00.11	34.950	28.08		1462.3							
	STO	00800	00.07	34.96	28.09	00.508	1462.9							
	STO	00900	- 0.01	34.97	28.10	00.511	1464.2							
	OBS	00985	- 0.08	34.980	28.11		1465.3							

N O O C S T A T I O N D A T A

REF10 31 8328	YEAR 1972	BOTOP 00955	AIR TEMP	DIR HGT PER	WIND-DIR 03	INST STO RECORDER	TEN SQ 1616
CONSEC 0011	MONTH 08	SHIP GL	WET BULB		WIND-SPD 04	TRACE DIR	5 SQUARE 2
LAT 71 13.0N	DAY 17	DATA USE 1	BAROMETR 1015.2	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 29.0W	HOUR 17.4	AREA 10	CLOUD T/A	CL/TR	WEATHER X1	ORIG WBS 034	1 SQUARE 16

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.10											
17.4	OBS	00005	00.10											
	OBS	00007	01.64											
	OBS	00009	00.46											
	STD	00010	01.55											
	OBS	00014	02.71	31.000	24.74		1456.1							
	OBS	00015	02.20	31.010	24.79		1453.9							
	OBS	00017	02.57	31.200	24.91		1455.9							
	STD	00020	02.09	31.21	24.98		1453.8							
	OBS	00020	02.09	31.210	24.96		1453.8							
	OBS	00024	02.38	31.550	25.21		1455.6							
	STD	00030	00.54	31.48	25.27		1447.4							
	OBS	00037	00.16	31.400	25.22 *		1445.6							
	OBS	00042	01.06	31.810	25.50		1450.4							
	OBS	00047	- 0.11	31.800	25.55		1445.1							
	STD	00050	00.50	31.90	25.61		1448.1							
	OBS	00052	00.80	32.60 P	26.15Q									
	OBS	00064	00.78	32.390	25.98 *		1450.3							
	OBS	00067	00.43	32.500	26.09		1448.9							
	STD	00075	00.65	32.51	26.09		1450.0							
	OBS	00078	00.73	32.510	26.08		1450.4							
	OBS	00085	- 1.22	32.600	26.24		1441.7							
	OBS	00088	- 0.75	32.610	26.23		1443.9							
	OBS	00097	- 1.10	32.750	26.36		1442.7							
	STD	00100	- 1.17	32.77	26.37		1442.4							
	OBS	00124	- 1.38	32.910	26.49		1442.0							
	STD	00125	- 1.36	32.92	26.50		1442.2							
	OBS	00130	- 1.33	33.000	26.56		1442.5							
	OBS	00134	- 1.42	33.080	26.63		1442.2							
	OBS	00137	- 1.30	33.120	26.66		1442.9							
	OBS	00145	- 1.52	33.160	26.70		1442.0							
	STD	00150	- 1.52	33.17	26.71		1442.1							
	OBS	00157	- 1.52	33.210	26.74		1442.3							
	OBS	00160	- 1.43	33.240	26.76		1442.8							
	OBS	00163	- 1.50	33.200	26.73 *		1442.5							
	OBS	00168	- 1.25	33.200	26.72		1443.8							
	OBS	00170	- 1.36	33.220	26.74		1443.3							
	OBS	00178	- 1.10	33.400	26.88		1444.9							
	OBS	00184	- 1.29	33.400	26.89		1444.1							
	STD	00200	- 1.24	33.68	27.11		1445.0							
	OBS	00201	- 1.23	33.700	27.13		1445.1							
	STD	00250	- 0.07	34.66	27.86		1452.6							
	OBS	00254	00.00	34.720	27.90		1453.1							
	STD	00300	00.18	34.79	27.95		1454.8							
	OBS	00392	00.43	34.900	28.02		1457.6							
	OBS	00726	00.17	34.950	28.08		1462.1							
	STD	00800	00.11	34.95	28.08		1463.0							
	STD	00900	00.02	34.95	28.08		1464.3							
	OBS	00937	- 0.01	34.950	28.09		1464.8							

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00492	AIR TEMP	OIR HGT PER	WIND-OIR 07	INST STD RECORDER	TEN SQ 1616
CONSEC 0012	MONTH 08	SHIP GL	WET BULB		WIND-SPD 10	TRACE OIR	5 SQUARE 2
LAT 71 13.0N	DAY 18	DATA USE 1	BAROMETR 1019.1	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 38.6W	HOUR 04.9	AREA 10	CLOUD T/A	CL/TR	WEATHER X4	DRIG W8S 035	1 SQUARE 18

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PJ4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.08	18.30	14.70	00.000	1426.8							
04.9	OBS	00000	00.08	18.300	14.70		1426.8							
	OBS	00005	01.78	27.000	21.62		1446.5							
	STD	00010	- 1.17	29.64	23.84	00.085	1436.5							
	OBS	00012	- 1.23	30.010	24.14		1436.8							
	OBS	00013	- 1.02	30.050	24.17		1437.9							
	OBS	00016	- 1.38	30.380	24.45		1436.7							
	STD	00020	- 1.39	30.48	24.53	00.122	1436.8							
	OBS	00026	- 1.41	30.800	24.79		1437.3							
	STD	00030	- 1.34	31.41	25.28	00.153	1438.5							
	OBS	00031	01.91 P	32.65 P	26.120									
	OBS	00035	- 1.25	30.40 P	24.460*									
	OBS	00038	01.09	32.000	25.65		1450.7							
	OBS	00040	- 0.29	32.020	25.74		1444.5							
	OBS	00042	00.27	32.020	25.71 *		1447.1							
	STD	00050	- 1.13	32.20	25.91	00.201	1441.0							
	OBS	00050	- 1.13	32.200	25.91		1441.0							
	OBS	00055	00.28	32.500	26.10		1448.0							
	OBS	00057	00.17	32.400	26.02 *		1447.4							
	OBS	00061	00.36	32.500	26.10		1448.5							
	OBS	00067	- 0.66	32.400	26.06 *		1443.7							
	OBS	00069	- 0.52	32.500	26.13		1444.6							
	STD	00075	- 1.26	32.50	26.16	00.250	1441.2							
	OBS	00077	- 1.28	32.550	26.20		1441.2							
	OBS	00079	- 1.19	32.620	26.25		1441.8							
	STD	00100	- 1.39	32.78	26.39	00.294	1441.4							
	OBS	00102	- 1.41	32.810	26.41		1441.4							
	OBS	00107	- 1.28	32.890	26.47		1442.2							
	STD	00125	- 1.50	32.93	26.51	00.333	1441.5							
	OBS	00142	- 1.52	33.000	26.57		1441.8							
	STD	00150	- 1.33	33.05	26.60	00.370	1442.9							
	OBS	00161	- 1.32	33.110	26.65		1443.2							
	OBS	00164	- 1.37	33.200	26.73		1443.1							
	OBS	00172	- 1.15	33.420	26.90		1444.6							
	OBS	00187	- 1.24	33.500	26.97		1444.5							
	STD	00200	- 0.93	33.83	27.22	00.427	1446.7							
	STD	00250	- 0.03	34.72	27.90	00.454	1452.9							
	OBS	00257	00.05	34.800	27.96		1453.5							
	STD	00300	00.23	34.86	28.00	00.462	1455.1							
	OBS	00332	00.33	34.890	28.02		1456.1							
	STD	00400	00.36	34.90	28.03	00.473	1457.4							
	STD	00500	00.41	34.92	28.04	00.482	1459.3							
	OBS	00502	00.41	34.920	28.04		1459.4							

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00225	AIR TEMP 00.3	OIR HGT PER	WIND-OIR 07	INST STD RECORDER	TEN SQ 1616
CONSEC 0013	MONTH 08	SHIP GL	WET BULB 00.3	07 1 2	WIND-SPD 11	TRACE OIR	5 SQUARE 2
LAT 71 09 N	DAY 18	DATA USE 1	BAROMETR 1015.1	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 36 W	HOUR 17.2	AREA 10	CLOUD T/A	CL/TR	WEATHER X*	DRIG W8S 036	1 SQUARE 18

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PJ4	TOT P	NO2	NO3	SIO3	PH
17.2	OBS	00022	00.75											
	OBS	00025	00.60											
	OBS	00029	01.23											
	STD	00030	00.61											
	OBS	00033	00.26											
	OBS	00035	01.29	31.840	25.51		1451.3							
	OBS	00049	01.08	31.920	25.59		1450.7							
	STD	00050	01.10	31.94	25.61		1450.9							
	OBS	00051	01.12	31.960	25.62		1451.0							
	STD	00075	- 1.16	32.59	26.23		1441.8							
	OBS	00076	- 1.22	32.610	26.25		1441.5							
	STD	00100	- 1.34	32.86	26.45		1441.7							
	OBS	00111	- 1.40	32.960	26.53		1441.8							
	OBS	00116	- 1.32	33.000	26.56		1442.3							
	OBS	00119	- 1.37	33.000	26.57		1442.1							
	OBS	00123	- 1.27	33.080	26.63		1442.7							
	STD	00125	- 1.30	33.09	26.64		1442.7							
	OBS	00131	- 1.34	33.150	26.69		1442.6							
	OBS	00139	- 1.28	33.270	26.78		1443.2							
	STD	00150	- 1.26	33.33	26.83		1443.6							
	STD	00200	- 1.17	33.60	27.04		1445.2							
	OBS	00204	- 1.16	33.620	27.06		1445.4							

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BOTDP 00507	AIR TEMP	00.8	DIR HGT PER	WIND-DIR 05	INST STD RECORDER	TEN SQ 1617
CONSEC	0014	MONTH 08	SHIP GL	WET BULB	00.6		WIND-SPD 18	TRACE DIR	5 SQUARE 1
LAT	71 16.1N	DAY 25	DATA USE 1	BAROMETR	1002.5	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG	150 04.1W	HOUR 15.6	AREA 10	CLOUD T/A		CL/TR	WEATHER X4	ORIG WBS 051	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
15.6	OBS	00039	- 0.66											
	OBS	00041	- 1.25											
	OBS	00044	01.34											
	OBS	00048	- 0.62											
	STD	00050	00.29	31.30	25.13		1446.3							
	OBS	00050	00.29	31.300	25.13		1446.3							
	OBS	00052	- 0.78	32.200	25.90		1442.6							
	OBS	00053	- 0.32	32.250	25.93		1444.9							
	OBS	00054	- 0.50	32.240	25.92		1444.0							
	OBS	00057	- 0.39	32.340	26.00		1444.7							
	STD	00075	- 0.64	32.41	26.06		1444.0							
	OBS	00083	- 0.77	32.440	26.09		1443.5							
	OBS	00092	- 0.93	32.480	26.13		1443.0							
	STD	00100	- 0.87	32.63	26.25		1443.6							
	OBS	00105	- 0.83	32.690	26.30		1444.0							
	OBS	00114	- 1.26	32.750	26.36		1442.2							
	STD	00125	- 1.33	32.86	26.45		1442.2							
	OBS	00132	- 1.35	32.62 P	26.26Q*									
	OBS	00140	- 1.35	33.000	26.57		1442.5							
	OBS	00143	- 1.25	33.090	26.64		1443.2							
	OBS	00148	- 1.35	33.180	26.71		1442.9							
	STD	00150	- 1.35	33.18	26.71		1443.0							
	OBS	00158	- 1.34	33.200	26.73		1443.2							
	OBS	00187	- 0.20	34.600	27.81		1450.9							
	STD	00200	- 0.03	34.66	27.86		1452.0							
	OBS	00222	00.20	34.750	27.91		1453.5							
	STD	00250	00.30	34.79	27.94		1454.5							
	STD	00300	00.41	34.85	27.98		1455.9							
	OBS	00352	00.42	34.900	28.02		1456.9							
	STD	00400	00.34	34.94	28.06		1457.4							
	OBS	00409	00.32	34.950	28.07		1457.5							

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BOTDP 01036	AIR TEMP	00.2	DIR HGT PER	WIND-DIR 08	INST STD RECORDER	TEN SQ 1616
CONSEC	0015	MONTH 08	SHIP GL	WET BULB	00.2		WIND-SPD 02	TRACE DIR	5 SQUARE 2
LAT	71 17.9N	DAY 26	DATA USE 1	BAROMETR	1006.2	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG	149 59.0W	HOUR 08.4	AREA 10	CLOUD T/A		CL/TR	WEATHER X4	ORIG WBS 052	1 SQUARE 19

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
08.4	OBS	00044	01.96	31.800	25.44		1454.4							
	STD	00050	00.95	31.65	25.38 *		1449.8							
	OBS	00051	00.78	31.40 P	25.19Q*									
	OBS	00052	00.92	31.600	25.34		1449.6							
	OBS	00055	00.48	31.750	25.49		1447.9							
	OBS	00060	00.59	32.100	25.76		1448.9							
	OBS	00063	00.03	31.80 P	25.55Q*									
	OBS	00069	00.47	32.300	25.93		1448.8							
	STD	00075	- 0.28	32.31	25.97		1445.5							
	OBS	00079	- 0.78	32.310	25.99		1443.2							
	OBS	00082	- 0.32	32.520	26.14		1445.7							
	OBS	00083	- 0.45	32.540	26.16		1445.2							
	OBS	00085	- 0.27 P	32.500	26.12Q*									
	STD	00100	- 1.07	32.76	26.36		1442.8							
	OBS	00117	- 1.40	33.000	26.57		1441.9							
	STD	00125	- 1.40	33.07	26.62		1442.1							
	OBS	00136	- 1.41	33.200	26.73		1442.5							
	STD	00150	- 1.31	33.47	26.94		1443.5							
	OBS	00167	- 1.19	33.790	27.20		1444.9							
	OBS	00170	- 0.94	34.090	27.43		1446.5							
	OBS	00179	- 0.47	34.470	27.72		1449.4							
	STD	00200	- 0.13	34.64	27.84		1451.5							
	OBS	00217	00.11	34.750	27.92		1453.0							
	STD	00250	00.16	34.78	27.94		1453.9							
	STD	00300	00.24	34.82	27.97		1455.1							
	OBS	00399	00.40	34.900	28.02		1457.6							
	STD	00400	00.41	34.90	28.03		1457.6							
	OBS	00407	00.46	34.920	28.04		1458.0							
	STD	00500	00.33	34.96	28.08		1459.0							
	OBS	00566	00.23	34.980	28.10		1459.7							
	STD	00600	00.18	34.98	28.10		1460.1							
	STD	00700	00.03	34.99	28.11		1461.1							
	OBS	00751	- 0.04	34.990	28.12		1461.6							

N O O C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTOP 02130	AIR TEMP 00.7	DIR HGT PER	WIND-DIR 09	INST STO RECORDER	TEN SQ 1617
CONSEC 0016	MONTH 08	SHIP GL	WET BULB 00.7		WIND-SPD 11	TRACE DIR	5 SQUARE 1
LAT 71 54 N	DAY 27	DATA USE 1	BAROMETR 1012.2	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 01 W	HOUR 03.6	AREA 10	CLOUD T/A	CL/TR	WEATHER X4	ORIG WBS 053	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	- 0.25											
03.6	OBS	00000	- 0.25											
	STO	00010	- 1.17											
	OBS	00010	- 1.17											
	OBS	00014	- 0.96	29.610	23.82		1437.6							
	OBS	00017	- 1.20	30.000	24.14		1437.0							
	STO	00020	- 1.36	30.11	24.23		1436.4							
	OBS	00027	- 1.37	30.500	24.54		1437.1							
	STO	00030	- 0.02	31.06	24.95		1444.2							
	OBS	00043	00.57	32.100	25.76		1448.6							
	OBS	00045	- 0.10	32.060	25.76		1445.5							
	OBS	00048	00.07	32.110	25.80		1446.4							
	STO	00050	- 0.63	32.15	25.86		1443.2							
	OBS	00053	- 1.13	32.240	25.94		1441.1							
	OBS	00057	- 0.75	32.390	26.05		1443.1							
	OBS	00058	- 1.00	32.270	25.97 *		1441.8							
	OBS	00060	- 0.75	32.390	26.05		1443.2							
	OBS	00063	- 1.03	32.400	26.07		1441.9							
	OBS	00065	- 0.78	32.480	26.13		1443.2							
	OBS	00070	- 1.21	32.600	26.24		1441.5							
	STO	00075	- 0.92	32.60	26.23		1442.9							
	OBS	00078	- 0.79	32.610	26.23		1443.6							
	STO	00100	- 1.29	32.80	26.40		1441.9							
	OBS	00110	- 1.52	33.000	26.57		1441.2							
	OBS	00112	- 1.43	33.050	26.61		1441.8							
	STO	00125	- 1.55	33.07	26.63		1441.4							
	OBS	00128	- 1.58	33.080	26.64		1441.4							
	OBS	00130	- 1.52	33.110	26.66		1441.7							
	OBS	00132	- 1.58	33.140	26.68		1441.5							
	STO	00150	- 1.56	33.23	26.76		1442.1							
	OBS	00154	- 1.55	33.270	26.79		1442.2							
	OBS	00173	- 1.24	33.510	26.97		1444.3							
	OBS	00183	- 1.26	33.700	27.13		1444.7							
	STO	00200	- 1.10	33.97	27.34		1446.1							
	OBS	00202	- 1.07	34.000	27.37		1446.3							
	OBS	00232	- 0.35	34.510	27.75		1450.8							
	STO	00250	- 0.21	34.63	27.84		1451.9							
	STO	00300	00.23	34.83	27.97		1455.1							
	OBS	00302	00.25	34.830	27.98		1455.2							
	OBS	00317	00.40	34.850	27.98		1456.2							
	STO	00400	00.45	34.90	28.02		1457.8							
	OBS	00432	00.45	34.910	28.03		1458.4							
	STO	00500	00.37	34.92	28.04		1459.2							
	STO	00600	00.26	34.93	28.06		1460.4							
	STO	00700	00.16	34.94	28.07		1461.6							
	OBS	00755	00.11	34.950	28.08		1462.3							
	OBS	01642	- 0.34	35.000	28.14		1475.3							
	STO	01750	- 0.35	35.00	28.14		1477.1							
	OBS	01862	- 0.35	35.000	28.14		1479.0							

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BOTDP 02194	AIR TEMP	00.1	DIR HGT PER	WIND-DIR 15	INST STO RECORDER	TEN SQ 1617
CONSEC	0017	MONTH 08	SHIP GL	WET BULB	00.1		WIND-SPD 03	TRACE DIR	5 SQUARE 1
LAT	71 41.3N	DAY 28	DATA USE 1	BAROMETR	1012.9	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG	151 02.2W	HOUR 09.0	AREA 10	CLOUD T/A		CL/TR	WEATHER X+	ORIG WBS 054	1 SQUARE 11

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	00.68	23.00	18.46	00.000	1436.0							
09.0	OBS	00000	00.68	23.000	18.46		1436.0							
	STO	00010	00.92	28.33	22.73	00.072	1444.5							
	OBS	00015	01.04	30.000	24.05		1447.4							
	STO	00020	01.84	31.00	24.81	00.113	1452.4							
	OBS	00020	01.84	31.000	24.81		1452.4							
	OBS	00026	- 0.89	31.390	25.25		1440.6							
	STD	00030	- 0.95	31.89	25.66	00.141	1441.1							
	OBS	00034	00.93 P	32.290	25.90Q									
	OBS	00039	- 1.07	32.00 P	25.75Q*									
	STO	00050	- 1.24	32.52	26.17	00.183	1440.9							
	OBS	00057	- 1.25	32.620	26.26		1441.1							
	OBS	00073	- 1.00	32.850	26.43		1442.9							
	STD	00075	- 1.12	32.85	26.44	00.226	1442.4							
	OBS	00082	- 1.23	32.850	26.44		1441.9							
	OBS	00084	- 1.18	32.920	26.50		1442.3							
	OBS	00092	- 1.32	32.940	26.52		1441.6							
	OBS	00098	- 1.30	32.960	26.53		1442.0							
	STD	00100	- 1.33	32.97	26.54	00.264	1441.9							
	OBS	00112	- 1.46	33.010	26.58		1441.6							
	STD	00125	- 1.25	33.05	26.61	00.301	1442.8							
	STD	00150	- 1.16	33.21	26.73	00.335	1443.9							
	OBS	00150	- 1.16	33.210	26.73		1443.9							
	OBS	00171	- 1.39	33.410	26.90		1443.4							
	OBS	00197	- 1.13	33.450	26.92		1445.2							
	STO	00200	- 1.17	33.45	26.93	00.396	1445.0							
	OBS	00212	- 1.23	33.530	26.99		1445.0							
	OBS	00237	- 0.90	34.080	27.42		1447.8							
	STD	00250	- 0.63	34.78	27.57	00.437	1449.5							
	OBS	00287	00.00	34.720	27.90		1453.7							
	STO	00300	00.06	34.74	27.92	00.455	1454.2							
	STD	00400	00.40	34.89	28.01	00.471	1457.6							
	OBS	00422	00.45	34.910	28.03		1458.2							
	STD	00500	00.35	34.93	28.05	00.480	1459.1							
	STD	00600	00.24	34.94	28.07	00.487	1460.3							
	STD	00700	00.13	34.96	28.09	00.492	1461.5							
	OBS	00705	00.13	34.960	28.05		1461.6							
	OBS	01332	- 0.30	34.980	28.13		1470.2							
	STO	01400	- 0.31	34.98	28.13		1471.3							
	STD	01500	- 0.33	34.99	28.13		1472.9							
	STD	01750	- 0.36	34.99	28.14		1477.0							
	STD	02000	- 0.40	35.00	28.15		1481.1							
	OBS	02002	- 0.40	35.000	28.15		1481.2							

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BOTOP 00940	AIR TEMP	01.2	DIR HGT PER	WIND-DIR 10	INST STO RECORDER	TEN SQ 1617
CONSEC	0018	MONTH 08	SHIP GL	WET BULB	01.2	25 2 2	WIND-SPD 12	TRACE DIR	5 SQUARE 1
LAT	71 26.1N	DAY 29	DATA USE 1	BAROMETR	1013.1	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG	151 58.3W	HOUR 12.6	AREA 10	CLOUD T/A		CL/TR	WEATHER X+	ORIG WBS 055	1 SQUARE 11

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	04.08	25.01	19.88	00.000	1453.9							
12.6	OBS	00000	04.08	25.010	19.88		1453.9							
	STO	00010	06.17	29.39	23.13	00.063	1468.5							
	OBS	00014	07.00	30.200	23.67		1473.0							
	STD	00020	05.87	30.22	23.82	00.107	1468.6							
	OBS	00022	04.65	30.220	23.95		1463.5							
	OBS	00023	03.88	30.220	24.03		1460.3							
	OBS	00026	04.35	30.400	24.12		1462.6							
	STD	00030	03.61	30.87	24.57	00.145	1460.1							
	OBS	00039	01.61	31.610	25.31		1452.5							
	OBS	00049	- 1.14	31.910	25.68		1440.5							
	STO	00050	- 0.87	32.04	25.78	00.201	1442.0							
	OBS	00054	- 0.22	32.400	26.04		1445.6							
	OBS	00061	- 0.83	32.410	26.07		1442.8							
	OBS	00064	- 0.66	32.420	26.07		1443.7							
	STD	00075	- 0.78	32.48	26.13	00.252	1443.4							
	STD	00100	- 1.07	32.68	26.30	00.297	1442.8							
	STD	00125	- 1.35	32.95	26.53	00.338	1442.2							
	OBS	00132	- 1.43	33.040	26.60		1442.1							
	OBS	00138	- 1.28	33.120	26.66		1443.0							
	OBS	00143	- 1.34	33.180	26.71		1442.9							
	STD	00150	- 1.31	33.27	26.78	00.372	1443.3							
	OBS	00182	- 1.19	33.800	27.21		1445.1							
	STO	00200	- 0.66	34.25	27.55	00.417	1448.5							
	OBS	00217	- 0.25	34.600	27.82		1451.2							
	STD	00250	- 0.05	34.70	27.89	00.436	1452.8							
	STD	00300	00.21	34.83	27.98	00.445	1455.0							
	OBS	00334	00.35	34.910	28.03		1456.3							
	OBS	00754	- 0.09	34.980	28.11		1461.4							
	STD	00800	- 0.12	34.98	28.12		1462.0							
	STO	00900	- 0.18	34.99	28.13		1463.5							
	STO	01000	- 0.22	34.99	28.13		1464.9							
	OBS	01000	- 0.22	34.990	28.13		1464.9							

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 02360	AIR TEMP 02.7	DIR HGT PER	WIND-DIR 22	INST STD RECORDER	TEN SQ 1617
CONSEC 0019	MONTH 08	SHIP GL	WET BULB 02.4	20 2 2	WIND-SPD 03	TRACE DIR	5 SQUARE 1
LAT 71 21.5N	DAY 30	DATA USE 1	BAROMETR 1011.6	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 46.5W	HOUR 05.7	AREA 10	CLOUD T/A	CL/TR	WEATHER X6	ORIG WBS 056	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.72											
05.7	OBS	00000	- 0.72											
	OBS	00007	01.83											
	STD	00010	02.46											
	OBS	00017	03.39	24.000	19.13		1449.8							
	STD	00020	02.95	25.46	20.32		1449.8							
	STD	00030	01.47	29.29	23.46		1448.6							
	OBS	00047	- 1.05	32.100	25.83		1441.2							
	OBS	00048	- 0.83	32.120	25.84		1442.2							
	STD	00050	- 1.32	32.10	25.83		1439.9							
	OBS	00050	- 1.32											
	OBS	00052	00.57											
	OBS	00056	- 0.88											
	OBS	00067	- 0.01	32.010	25.72 *		1446.2							
	STD	00075	- 1.00	32.03	25.77		1441.8							
	OBS	00077	- 1.02	32.060	25.80		1441.7							
	OBS	00083	- 0.53	32.200	25.89		1444.3							
	OBS	00099	- 1.03	32.510	26.16		1442.7							
	STD	00100	- 0.82	32.52	26.16		1443.7							
	OBS	00100	- 0.82	32.520	26.16		1443.7							
	OBS	00110	- 1.18	32.690	26.31		1442.4							
	OBS	00113	- 0.95 P	32.610	26.240*									
	STD	00125	- 1.42	32.71	26.33		1441.5							
	STD	00150	- 1.45	33.12	26.67		1442.4							
	OBS	00150	- 1.45	33.120	26.67		1442.4							
	OBS	00196	- 0.25	34.550	27.78		1450.8							
	STD	00200	- 0.19	34.59	27.80		1451.2							
	OBS	00225	00.12	34.780	27.94		1453.3							
	STD	00250	00.23	34.83	27.98		1454.2							
	OBS	00290	00.35	34.890	28.02		1455.5							
	STD	00300	00.37	34.90	28.03		1455.8							
	OBS	00389	00.43	34.950	28.06		1457.6							

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 02126	AIR TEMP 01.8	DIR HGT PER	WIND-DIR 11	INST STD RECORDER	TEN SQ 1617
CONSEC 0020	MONTH 09	SHIP GL	WET BULB 01.7	13 3 3	WIND-SPD 18	TRACE DIR	5 SQUARE 1
LAT 71 54.6N	DAY 03	DATA USE 1	BAROMETR 1017.6	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 152 04.7W	HOUR 07.7	AREA 10	CLOUD T/A	CL/TR	WEATHER X2	ORIG WBS 062	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	02.20	25.50	20.40	00.000	1446.3							
07.7	OBS	00000	02.20	25.500	20.40		1446.3							
	OBS	00003	04.25	28.690	22.78		1459.5							
	STD	00010	00.30	28.99	23.28	00.060	1442.5							
	OBS	00015	- 0.71	29.200	23.48		1438.2							
	OBS	00019	- 0.44	30.120	24.21		1440.8							
	STD	00020	- 0.61	30.15	24.24	00.101	1440.1							
	OBS	00025	- 0.67	30.310	24.37		1440.1							
	OBS	00027	- 0.33	30.520	24.53		1442.0							
	OBS	00029	- 0.61	30.500	24.52		1440.7							
	STD	00030	- 0.58	30.55	24.56	00.137	1440.9							
	OBS	00036	- 0.38	30.710	24.69		1442.2							
	OBS	00037	- 0.72	30.720	24.71		1440.6							
	OBS	00042	00.00	31.170	25.04		1444.7							
	STD	00050	- 0.83	31.58	25.41	00.196	1441.5							
	OBS	00052	- 1.04	31.680	25.49		1440.7							
	OBS	00055	- 0.56	31.820	25.59		1443.2							
	OBS	00063	- 1.25	32.050	25.79		1440.4							
	STD	00075	- 1.35	32.32	26.02	00.253	1440.5							
	OBS	00082	- 1.38	32.470	26.14		1440.7							
	STD	00100	- 1.30	32.70	26.32	00.300	1441.7							
	STD	00125	- 1.07	33.01	26.57	00.339	1443.6							
	OBS	00148	- 0.75	33.290	26.78		1445.9							
	STD	00150	- 0.70	33.31	26.80	00.373	1446.2							
	OBS	00187	00.05	33.750	27.12		1450.9							
	STD	00200	00.11	34.03	27.34	00.424	1451.8							
	STD	00250	00.31	34.81	27.96	00.446	1454.6							
	OBS	00257	00.33	34.890	28.02		1454.9							
	STD	00300	00.38	34.90	28.03	00.453	1455.9							
	OBS	00372	00.43	34.920	28.04		1457.3							
	OBS	00755	00.02	34.950	28.09		1461.9							
	OBS	01352	- 0.33	34.990	28.14		1470.4							
	STD	01400	- 0.34	34.99	28.14		1471.2							
	STD	01500	- 0.35	34.99	28.14		1472.8							
	STD	01750	- 0.38	34.99	28.14		1476.9							
	OBS	01892	- 0.40	34.990	28.14		1479.3							

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 01046	AIR TEMP 02.6	DIR HGT PER	WIND-DIR 07	INST STD RECORDER	TEN SQ 1617
CONSEC 0021	MONTH 09	SHIP GL	WET BULB 02.6	09 3 2	WIND-SPD 11	TRACE DIR	5 SQUARE 1
LAT 71 39.7N	DAY 04	DATA USE 1	BARDMETR 1015.6	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 152 03.0W	HOUR 03.6	AREA 10	CLOUD T/A	CL/TR	WEATHER K4	ORIG W8S 063	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.80	29.00	23.07	00.000	1458.0							
03.6	OBS	00000	03.80											
	OBS	00008	05.61 P	29.000	22.890*									
	STD	00010	04.56	29.52	23.41	00.046	1462.0							
	OBS	00010	04.56	29.520	23.41		1462.0							
	OBS	00013	05.84	30.120	23.75		1468.2							
	STD	00020	02.24	29.66	23.71 *	00.090	1452.3							
	OBS	00021	01.87	29.590	23.68 *		1450.6							
	STD	00030	00.21	30.50	24.49	00.128	1444.5							
	OBS	00030	00.21	30.500	24.49		1444.5							
	OBS	00035	- 0.17	30.300	24.35 *		1442.6							
	STD	00050	- 0.67	31.40	25.25	00.190	1442.0							
	OBS	00064	- 1.04	32.200	25.91		1441.6							
	STD	00075	- 1.20	32.46	26.12	00.248	1441.4							
	STD	00100	- 1.47	32.90	26.49	00.291	1441.2							
	STD	00125	- 1.60	33.16	26.70	00.327	1441.4							
	OBS	00127	- 1.60	33.170	26.71		1441.4							
	OBS	00140	- 1.60	33.220	26.75		1441.7							
	STD	00150	- 1.32	33.23	26.75	00.360	1443.2							
	OBS	00191	- 0.40	33.520	26.95		1448.5							
	STD	00200	- 0.29	33.75	27.13	00.415	1449.5							
	STD	00250	00.18	34.72	27.89	00.444	1453.8							
	OBS	00258	00.23	34.820	27.97		1454.4							
	STD	00300	00.31	34.86	28.00	00.453	1455.5							
	OBS	00358	00.39	34.910	28.03		1456.9							
	OBS	00751	00.15	34.950	28.08		1462.4							
	STD	00800	00.11	34.96	28.09		1463.0							
	STD	00900	00.00	34.97	28.10		1464.3							
	OBS	00939	- 0.04	34.980	28.11		1464.7							

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00026	AIR TEMP 03.9	DIR HGT PER	WIND-DIR 00	INST NANSEN CAST	TEN SQ 1616
CONSEC 0022	MONTH 08	SHIP GL	WET BULB 03.0		WIND-SPD 00	TRACE DIR	5 SQUARE 1
LAT 70 13.3N	DAY 04	DATA USE 1	BARDMETR 1003.7	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 143 06.3W	HOUR 12.9	AREA 10	CLOUD T/A /0	CL/TR	WEATHER X3	ORIG W8S 001	1 SQUARE 03

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.10	30.07	24.16	00.000	1442.0	08.71						
12.9	OBS	00000	- 0.10	30.071	24.16		1442.0	08.71	1.88		0.08	00.0	004.	
12.9	OBS	00005	- 0.92	31.112	25.03		1439.7	08.39	1.77		0.15	02.0	019.	
	STD	00010	- 1.40	32.04	25.79	00.030	1438.8	07.29						
12.9	OBS	00010	- 1.40	32.038	25.79		1438.8	07.29	1.07		0.22	08.9	027.	
12.9	OBS	00015	- 1.45	32.246	25.96		1438.9	06.99	1.31		0.25	10.9	026.	
	STD	00020	- 1.19	32.44	26.11	00.051	1440.5	06.72						
12.9	OBS	00020	- 1.19	32.444	26.11		1440.5	06.72	1.58		0.26	13.4	022.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00049	AIR TEMP 04.1	DIR HGT PER	WIND-DIR 21	INST NANSEN CAST	TEN SQ 1616
CONSEC 0023	MONTH 08	SHIP GL	WET BULB 03.3	06 2 2	WIND-SPD 04	TRACE DIR	5 SQUARE 1
LAT 70 22.9N	DAY 04	DATA USE 1	BARDMETR 1002.6	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 143 29.6W	HOUR 17.8	AREA 10	CLOUD T/A 0/2	CL/TR	WEATHER X1	ORIG W8S 002	1 SQUARE 03

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	02.61	28.22	22.54	00.000	1451.7	08.35						
17.8	OBS	00000	02.61	28.216	22.54		1451.7	08.35	0.80		0.05	00.0	002.	
17.8	OBS	00005	01.33	29.495	23.63		1447.8	08.93	0.77		0.08	00.1	003.	
	STD	00010	- 1.00	30.69	24.69	00.043	1438.8	08.84						
17.8	OBS	00010	- 1.00	30.687	24.69		1438.8	08.84	0.67		0.08	01.0	012.	
17.8	OBS	00015	- 1.10	31.026	24.96		1438.9	08.74	0.80		0.14	03.6	012.	
	STD	00020	- 1.25	31.73	25.54	00.072	1439.3	08.01						
17.8	OBS	00020	- 1.25	31.733	25.54		1439.3	08.01	0.92		0.15	07.7	018.	
	STD	00030	- 1.40	32.72	26.34	00.092	1440.1	06.95						
17.8	OBS	00030	- 1.40	32.719	26.34		1440.1	06.95	1.12		0.16	15.0	024.	
17.8	OBS	00040	- 1.40	32.718	26.34		1440.3	06.94	1.50		0.16	14.0	024.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTOP 00055	AIR TEMP 06.0	DIR HGT PER	WIND-DIR 17	INST NANSEN CAST	TEN SQ 1616
CONSEC 0024	MONTH 08	SHIP GL	WET BULB 04.4	27 5 3	WIND-SPD 01	TRACE DIR	5 SQUARE 1
LAT 70 32.5N	DAY 05	DATA USE 1	BAROMETR 1002.0	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 143 33.9W	HOUR 01.4	AREA 10	CLOUD T/A /0	CL/TR	WEATHER X0	ORIG W8S 003	1 SQUARE 03

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	P34	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.97	28.81	23.10	00.000	1445.2	08.67						
01.4	OBS	00000	00.97	28.809	23.10		1445.2	08.67	0.00		0.05	00.0	004.	
01.4	OBS	00005	00.20	30.053	24.14		1443.4	09.00	0.41		0.08	00.3	012.	
	STD	00010	- 0.92	30.61	24.62	00.041	1439.1	08.84						
01.4	OBS	00010	- 0.92	30.610	24.62		1439.1	08.84	0.60		0.08	01.4	018.	
01.4	OBS	00015	- 0.86	31.099	25.02		1440.1	08.78	0.74		0.21	02.1	005.	
	STD	00020	- 0.95	31.73	25.53	00.069	1440.7	07.92						
01.4	OBS	00020	- 0.95	31.735	25.53		1440.7	07.92	0.99		0.18	07.4	021.	
	STD	00030	- 1.38	32.34	26.03	00.092	1439.7	07.48						
01.4	OBS	00030	- 1.38	32.338	26.03		1439.7	07.48	1.25		0.13	13.6	021.	
01.4	OBS	00040	- 1.40	32.617	26.26		1440.1	07.36	1.37		0.16	15.8	028.	
	STD	00050	- 1.36	32.73	26.35	00.128	1440.6	07.11						
01.4	OBS	00050	- 1.36	32.729	26.35		1440.6	07.11	1.41		0.24	16.3	032.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTOP 00485	AIR TEMP 05.6	DIR HGT PER	WIND-DIR 19	INST NANSEN CAST	TEN SQ 1616
CONSEC 0025	MONTH 08	SHIP GL	WET BULB 04.7	04 2 3	WIND-SPD 03	TRACE DIR	5 SQUARE 1
LAT 70 45 N	DAY 05	DATA USE 1	BAROMETR 0999.6	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 143 31 W	HOUR 09.1	AREA 10	CLOUD T/A 0/3	CL/TR	WEATHER X1	ORIG W8S 004	1 SQUARE 03

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	P34	TOT P	NO2	NO3	SIO3	PH
	STD	00000	04.87	25.59	20.27	00.000	1458.0	07.85						
09.1	OBS	00000	04.87	25.586	20.27		1458.0	07.85	0.79		0.14	00.0	002.	
09.1	OBS	00005	04.22	27.031	21.47		1457.2	07.99	0.83		0.11	00.0	023.	
	STD	00010	- 1.05	30.62	24.64	00.054	1438.5	09.63						
09.1	OBS	00010	- 1.05	30.623	24.64		1438.5	09.63	0.36		0.11	00.1	024.	
09.1	OBS	00015	- 1.29	30.33 P	24.40Q*			09.27	0.49		0.11	01.0	028.	
	STD	00020	- 1.44	30.52	24.56	00.087	1436.7	09.01						
09.1	OBS	00020	- 1.44	30.525	24.56		1436.7	09.01	0.55		0.18	02.5	032.	
	STD	00030	- 1.49	30.80	24.79	00.120	1437.0	08.67						
09.1	OBS	00030	- 1.49	30.802	24.79		1437.0	08.67	0.78		0.29	05.3	010.	
09.1	OBS	00040	- 1.37	31.369	25.25		1438.5	08.44	0.78		0.13	06.5	034.	
	STD	00050	- 1.31	32.06	25.81	00.174	1439.9	07.76						
09.1	OBS	00050	- 1.31	32.062	25.81		1439.9	07.76	1.06		0.18	10.7	042.	
	STD	00075	- 1.48	32.55	26.20	00.224	1440.2	07.19						
09.1	OBS	00075	- 1.48	32.549	26.20		1440.2	07.19	1.51		0.10	17.7	043.	
	STD	00100	- 1.50	32.84	26.44	00.267	1441.0	06.71						
09.1	OBS	00100	- 1.50	32.843	26.44		1441.0	06.71	1.26		0.14	18.9	043.	
	STD	00125	- 1.35	33.06	26.61	00.304	1442.4	06.86						
09.1	OBS	00125	- 1.35	33.49 P	26.96Q			06.86	1.46		0.13	14.5	042.	
	STD	00150	- 1.21	33.33	26.83 *	00.337	1443.8	07.06						
09.1	OBS	00150	- 1.21	33.326	26.83		1443.8	07.06	1.35		0.18	17.5	036.	
	STD	00200	- 0.92	34.03	27.39	00.385	1447.0	06.19						
09.1	OBS	00200	- 0.92	34.033	27.39		1447.0	06.19	1.09		0.12	16.3	030.	
	STD	00250	- 0.23	34.15	27.45	00.418	1451.2	06.19						
	STD	00300	00.22	34.28	27.54	00.448	1454.3	06.19						
09.1	OBS	00300	00.22	34.74 P	27.91Q			06.19	0.92		0.06	16.1	019.	
	STD	00400	00.42	34.60	27.78 *	00.493	1457.3	06.48						
09.1	OBS	00400	00.42	34.598	27.78		1457.3	06.48	0.75		0.03	16.1	015.	
09.1	OBS	00475	00.21	34.876	28.02		1458.0	06.64	0.72		0.05	16.4	013.	

N O O C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00925	AIR TEMP 05.0	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1616
CONSEC 0026	MONTH 08	SHIP GL	WET BULB 04.4		WIND-SPD 03	TRACE DIR	5 SQUARE 1
LAT 70 51.7N	DAY 05	DATA USE 1	BAROMETR 0998.2	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 143 45.4W	HOUR 23.1	AREA 10	CLOUD T/A 0/2	CL/TR	WEATHER X1	ORIG WBS 005	1 SQUARE 03

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	05.21	21.28	16.85	00.000	1453.8	07.76						
23.1	OBS	00000	05.21	21.281	16.85		1453.8	07.76	1.33		0.00	00.4	003.	
23.1	OBS	00005	04.23	22.333	17.76		1451.1	08.01	1.76		0.00	00.4	006.	
	STD	00010	- 0.61	27.55	22.15	00.082	1436.3	09.72						
23.1	OBS	00010	- 0.61	27.552	22.15		1436.3	09.72	0.50		0.21	01.8	010.	
23.1	OBS	00015	- 1.20	30.028	24.16		1437.0	09.57	0.63		0.20	03.8	021.	
	STD	00020	- 1.30	30.38	24.44	00.128	1437.1	09.14						
23.1	OBS	00020	- 1.30	30.376	24.44		1437.1	09.14	1.05		0.13	07.9	019.	
	STD	00030	- 1.48	30.66	24.67	00.162	1436.8	08.98						
23.1	OBS	00030	- 1.48	30.657	24.67		1436.8	08.98	1.48		0.18	10.5	017.	
23.1	OBS	00040	- 1.51	30.978	24.93		1437.3	08.57	1.22		0.13		021.	
	STD	00050	- 1.30	32.04	25.79	00.217	1439.9	07.78						
23.1	OBS	00050	- 1.30	32.038	25.79		1439.9	07.78	1.48		0.18	06.6	040.	
	STD	00075	- 1.36	32.54	26.20	00.268	1440.8	07.29						
23.1	OBS	00075		32.543				07.29						
	STD	00100	- 1.43	32.93	26.51	00.309	1441.4	07.06						
23.1	OBS	00100	- 1.43	32.929	26.51		1441.4	07.06	1.52		0.21	15.2	042.	
	STD	00125	- 0.96	33.09	26.62	00.346	1444.2	07.66						
23.1	OBS	00125	- 0.96	33.088	26.62		1444.2	07.66	1.33		0.10	14.0	029.	
	STD	00150	- 1.05	33.23	26.74	00.380	1444.4	07.39						
23.1	OBS	00150	- 1.05	33.230	26.74		1444.4	07.39	0.98		0.12	13.6	020.	
	STD	00200	- 1.00	33.96	27.33	00.431	1446.5	06.27						
23.1	OBS	00200	- 1.00	33.960	27.33		1446.5	06.27	1.04		0.08	13.7	000.	
	STD	00250	- 0.32	34.57	27.80	00.458	1451.4	06.14						
23.1	OBS	00250		34.575				06.14	1.03		0.17	17.5	017.	
	STD	00300	00.14	34.71	27.89	00.471	1454.5	06.16						
23.1	OBS	00300	00.14	34.710	27.89		1454.5	06.16	1.20		0.17	15.5	035.	
23.1	OBS	00301		34.680				06.16	0.95		0.10	15.4	018.	
	STD	00400	00.43	34.83	27.97	00.490	1457.6	06.46						
23.1	OBS	00400	00.43	34.831	27.97		1457.6	06.46	1.18		0.13	15.6	022.	
23.1	OBS	00401		34.817				06.46	0.97		0.18	15.5	017.	
	STD	00500	00.41	34.86	27.99	00.505	1459.3	06.59						
23.1	OBS	00500	00.41	34.856	27.99		1459.3	06.59	1.02		0.15	15.3	022.	
23.1	OBS	00501		34.855				06.59	0.84		0.15	15.7	013.	
	STD	00600		34.86				06.68						
23.1	OBS	00600		34.861				06.68	0.87		0.19	12.1	019.	
	STD	00700		34.87				06.73						
23.1	OBS	00700		34.874				06.73	0.80		0.12	15.0	000.	
	STD	00800		34.87										
23.1	OBS	00800		34.867					0.80		0.10	15.1	000.	
	STD	00900		34.87										
23.1	OBS	00900		34.872					0.79		0.10	15.2	004.	

N O O C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00513	AIR TEMP 03.3	DIR HGT PER	WIND-DIR 31	INST NANSEN CAST	TEN SQ 1616
CONSEC 0027	MONTH 08	SHIP GL	WET BULB 03.1		WIND-SPD 04	TRACE DIR	5 SQUARE 1
LAT 70 51.9N	DAY 06	DATA USE 1	BAROMETR 1000.5	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 144 31.8W	HOUR 14.2	AREA 10	CLOUD T/A 7/5	CL/TR	WEATHER X1	ORIG WBS 006	1 SQUARE 04

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	04.67	24.41	19.37	00.000	1455.6	07.89						
14.2	OBS	00000	04.67	24.414	19.37		1455.6	07.89	1.59		0.00	00.3	009.	
14.2	OBS	00005	02.00	27.239	21.80		1447.8	08.86	0.42		0.10	00.5	007.	
	STD	00010	- 1.08	29.46	23.69	00.063	1436.7	09.49						
14.2	OBS	00010	- 1.08	29.457	23.69		1436.7	09.49	0.51		0.18	01.9	006.	
14.2	OBS	00015	- 1.18	29.961	24.10		1437.0	09.42	0.57		0.10	02.1	004.	
	STD	00020	- 1.30	30.22	24.31	00.102	1436.9	09.27						
14.2	OBS	00020	- 1.30	30.218	24.31		1436.9	09.27	0.92		0.16	06.0	007.	
	STD	00030	- 1.47	30.49	24.54	00.137	1436.6	08.93						
14.2	OBS	00030	- 1.47	30.494	24.54		1436.6	08.93	1.40		0.05	11.3	019.	
14.2	OBS	00040	- 0.82	30.945	24.89		1440.5	08.84	1.54		0.18	12.7	033.	
	STD	00050	- 1.36	31.60	25.43	00.197	1439.0	08.20						
14.2	OBS	00050	- 1.36	31.596	25.43		1439.0	08.20	1.69		0.10	13.9	040.	
	STD	00075	- 1.36	32.43	26.10	00.252	1440.6	07.43						
14.2	OBS	00075	- 1.36	32.426	26.10		1440.6	07.43	1.42		0.18	09.5	036.	
	STD	00100	- 1.31	32.79	26.39	00.297	1441.8	07.03						
14.2	OBS	00100	- 1.31	32.788	26.39		1441.8	07.03	1.47		0.08	16.7	032.	
	STD	00125	- 1.39	33.04	26.60	00.335	1442.2	06.77						
14.2	OBS	00125	- 1.39	33.045	26.60		1442.2	06.77	2.07		0.04	14.9	013.	
	STD	00150	- 1.06	33.33	26.83	00.368	1444.5	07.40						
14.2	OBS	00150	- 1.06	33.334	26.83		1444.5	07.40	0.93		0.06	14.6	011.	
	STD	00200	- 0.85	34.10	27.44	00.415	1447.4	06.13						
14.2	OBS	00200	- 0.85	34.104	27.44		1447.4	06.13	1.14		0.10	14.0	006.	
	STD	00250	- 0.19	34.50	27.73	00.440	1451.8	06.15						
	STD	00300	00.24	34.75	27.91	00.455	1455.0	06.22						
14.2	OBS	00300	00.24	34.752	27.91		1455.0	06.22	0.80		0.08	14.0	000.	
	STD	00400	00.44	34.85	27.98	00.472	1457.7	06.50						
14.2	OBS	00400	00.44	34.853	27.98		1457.7	06.50	0.75		0.07	14.2	000.	
14.2	OBS	00485	00.26	34.855	28.00		1458.3	06.60	0.70		0.16	13.4	000.	

N O D O C S T A T I O N D A T A

REFID	31 8328	YEAR	1972	BOTOP	00311	AIR TEMP	06.7	DIR HGT PER		WIND-DIR	16	INST NANSEN CAST		TEN SQ	1616
CONSEC	0028	MONTH	08	SHIP GL		WET BULB	06.1			WIND-SPD	04	TRACE DIR		5 SQUARE	1
LAT	70 43 N	DAY	06	DATA USE	1	BAROMETR	1002.0	SEA		WIND-FOR		DURATION		2 SQUARE	04
LONG	144 32 W	HOUR	23.0	AREA	10	CLOUD T/A	7/7	CL/TR		WEATHER	X1	ORIG WBS	007	1 SQUARE	04

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	05.81	26.11	20.60	00.000	1462.6	07.66						
23.0	OBS	00000	05.81	26.113	20.60		1462.6	07.66	0.53		0.00	00.3	010.	
23.0	OBS	00005	02.30	29.128	23.28		1451.7	08.87	0.47		0.13	01.8	011.	
	STD	00010	- 1.09	30.28	24.36	00.054	1437.8	09.29						
23.0	OBS	00010	- 1.09	30.278	24.36		1437.8	09.29						
23.0	OBS	00015	- 1.29	30.566	24.60		1437.4	08.96						
	STD	00020	- 1.44	30.70	24.71	00.088	1436.9	08.71						
23.0	OBS	00020	- 1.44	30.702	24.71		1436.9	08.71	1.17		0.20	01.9	001.	
	STD	00030	- 1.51	30.95	24.91	00.119	1437.1	08.44						
23.0	OBS	00030	- 1.51	30.955	24.91		1437.1	08.44	1.32		0.31	03.9	000.	
23.0	OBS	00040	- 1.32	31.895	25.67		1439.5	07.89	1.72		0.16	06.1	006.	
	STD	00050	- 1.37	32.00	25.76	00.172	1439.6	07.44						
23.0	OBS	00050	- 1.37	32.004	25.76		1439.6	07.44	1.94		0.16	09.2	013.	
	STD	00075	- 1.36	32.73	26.34	00.221	1441.0	07.15						
23.0	OBS	00075	- 1.36	32.726	26.34		1441.0	07.15	2.00		0.18	26.9	021.	
	STD	00100	- 1.22	32.96	26.53	00.261	1442.4	07.42						
23.0	OBS	00100	- 1.22	32.957	26.53		1442.4	07.42	2.05		0.23	08.7	022.	
	STD	00125	- 1.24	33.05	26.61	00.298	1442.9	07.28						
23.0	OBS	00125	- 1.24	33.055	26.61		1442.9	07.28	2.02		0.23	10.0	024.	
	STD	00150	- 1.28	33.14	26.68	00.333	1443.2	07.19						
23.0	OBS	00150	- 1.28	33.145	26.68		1443.2	07.19	1.96		0.24	13.1	026.	
	STD	00200	- 1.18	33.35	26.85	00.397	1444.8	07.01						
23.0	OBS	00200	- 1.18	33.354	26.85		1444.8	07.01	0.88		0.26	10.8	027.	
	STD	00250	- 0.52	34.04	27.38	00.444	1449.7	06.53						
23.0	OBS	00280	00.14	34.685	27.87		1454.1	06.10	0.75		0.07	15.2	012.	

N O D O C S T A T I O N D A T A

REFID	31 8328	YEAR	1972	BOTOP	00128	AIR TEMP	06.1	DIR HGT PER		WIND-DIR	26	INST NANSEN CAST		TEN SQ	1616
CONSEC	0029	MONTH	08	SHIP GL		WET BULB	05.1	26 1 2		WIND-SPD	09	TRACE DIR		5 SQUARE	1
LAT	70 38.8N	DAY	07	DATA USE	1	BAROMETR	1004.5	SEA		WIND-FOR		DURATION		2 SQUARE	04
LONG	144 33.0W	HOUR	09.0	AREA	10	CLOUD T/A	8/7	CL/TR		WEATHER	X1	ORIG WBS	008	1 SQUARE	04

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	05.10	28.23	22.34	00.000	1462.4	07.85						
09.0	OBS	00000	05.10	28.231	22.34		1462.4	07.85	0.00		0.16	00.0	001.	
09.0	OBS	00005	03.31	29.227	23.29		1456.2	08.30	0.20		0.15	00.4	002.	
	STD	00010	00.65	29.87	23.97	00.047	1445.3	09.13						
09.0	OBS	00010	00.65	29.872	23.97		1445.3	09.13	0.10		0.08	00.2	003.	
09.0	OBS	00015	- 0.83	30.734	24.72		1439.8	09.10	0.10		0.22	02.1	003.	
	STD	00020	- 0.15	30.96	24.88	00.082	1443.3	09.23						
09.0	OBS	00020	- 0.15	30.964	24.88		1443.3	09.23	0.14		0.11	00.6	001.	
	STD	00030	- 1.00	31.50	25.34	00.111	1440.3	08.28						
09.0	OBS	00030	- 1.00	31.500	25.34		1440.3	08.28	0.21		0.20	04.3	002.	
09.0	OBS	00040	- 1.34	32.076	25.82		1439.6	07.78	0.18		0.19	08.5	010.	
	STD	00050	- 1.37	32.37	26.06	00.157	1440.1	07.54						
09.0	OBS	00050	- 1.37	32.374	26.06		1440.1	07.54	0.24		0.21	10.1	019.	
	STD	00075	- 1.38	32.70	26.32	00.203	1440.9	07.13						
09.0	OBS	00075	- 1.38	32.699	26.32		1440.9	07.13	0.85		0.26	12.0	022.	
	STD	00100	- 1.28	32.81	26.41	00.244	1442.0	07.19						
09.0	OBS	00100	- 1.28	32.815	26.41		1442.0	07.19	1.06		0.24	10.8	025.	
09.0	OBS	00115	- 1.20	32.856	26.44		1442.6	07.34			0.00	16.0	018.	

N O D O C S T A T I O N D A T A

REFID	31 8328	YEAR	1972	BOTOP	00050	AIR TEMP	05.1	DIR HGT PER		WIND-DIR	26	INST NANSEN CAST		TEN SQ	1616
CONSEC	0030	MONTH	08	SHIP GL		WET BULB	03.8	26 1 2		WIND-SPD	18	TRACE DIR		5 SQUARE	1
LAT	70 30.8N	DAY	07	DATA USE	1	BAROMETR	1007.0	SEA		WIND-FOR		DURATION		2 SQUARE	04
LONG	144 27 W	HOUR	14.4	AREA	10	CLOUD T/A	8/8	CL/TR		WEATHER	X2	ORIG WBS	009	1 SQUARE	04

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	04.31	28.19	22.38	00.000	1459.1	07.91						
14.4	OBS	00000	04.31	28.194	22.38		1459.1	07.91	0.00		0.13	00.1	002.	
14.4	OBS	00005	03.63	28.567	22.74		1456.7	08.21	0.22		0.18	00.0	003.	
	STD	00010	- 0.35	30.48	24.50	00.045	1441.6	09.21						
14.4	OBS	00010	- 0.35	30.482	24.50		1441.6	09.21	0.36		0.14	00.0	008.	
14.4	OBS	00015	- 1.02	30.946	24.90		1439.2	09.29	0.60		0.14	00.0	011.	
	STD	00020	- 0.37	31.24	25.11	00.076	1442.7	08.75						
14.4	OBS	00020	- 0.37	31.240	25.11		1442.7	08.75	0.70		0.12	00.8	004.	
	STD	00030	- 1.26	31.89	25.67	00.102	1439.6	07.82						
14.4	OBS	00030	- 1.26	31.895	25.67		1439.6	07.82	0.75		0.27	07.6	008.	
14.4	OBS	00040	- 1.37	32.330	26.02		1439.9	07.51	1.06		0.21	09.8	019.	
14.4	OBS	00045	- 1.39	32.669	26.30		1440.3	06.94	1.08		0.19	12.1	030.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00034	AIR TEMP 03.6	DIR HGT PER	WIND-DIR 19	INST NANSEN CAST	TEN SQ 1616
CONSEC 0031	MONTH 08	SHIP GL	WET BULB 02.8	19 1 2	WIND-SPD 12	TRACE DIR	5 SQUARE 1
LAT 70 19.3N	DAY 08	DATA USE 1	BAROMETR 1011.0	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 144 46.5W	HOUR 02.5	AREA 10	CLOUD T/A 8/7	CL/TR	WEATHER X1	ORIG WBS 010	1 SQUARE 04

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.56	28.28	22.51	00.000	1456.0	08.30						
02.5	OBS	00000	03.56	28.279	22.51		1456.0	08.30	0.00		0.19	01.0	002.	
02.5	OBS	00005	00.20	32.60 P	26.180			09.47	0.00		0.11	00.0	004.	
	STD	00010	- 0.74	30.94	24.88 *	00.042	1440.4	09.61						
02.5	OBS	00010	- 0.74	30.941	24.88		1440.4	09.61	0.00		0.16	00.4	000.	
02.5	OBS	00015	- 0.92	31.317	25.19		1440.1	09.90	0.00		0.11	00.1	004.	
	STD	00020	- 1.10	32.01	25.76	00.069	1440.3	08.06						
02.5	OBS	00020		32.008				08.06	1.12		0.13	03.7	049.	
	STD	00030	- 1.46					06.87						
02.5	OBS	00030	- 1.46	30.22 P	24.320*			06.87	0.30		0.18	11.5	018.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00020	AIR TEMP 02.8	DIR HGT PER	WIND-DIR 25	INST NANSEN CAST	TEN SQ 1616
CONSEC 0032	MONTH 08	SHIP GL	WET BULB 02.3		WIND-SPD 12	TRACE DIR	5 SQUARE 1
LAT 70 09.5N	DAY 08	DATA USE 1	BAROMETR 1012.6	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 144 22.7W	HOUR 12.1	AREA 10	CLOUD T/A 8/7	CL/TR	WEATHER X1	ORIG WBS 011	1 SQUARE 04

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	02.05	25.87	20.70	00.000	1446.1	08.68						
12.1	OBS	00000	02.05	25.871	20.70		1446.1	08.68	0.76		0.15	01.4	002.	
12.1	OBS	00005	- 0.17	29.713	23.88		1441.3	10.22	0.69		0.14	00.4	003.	
	STD	00010	- 1.12	31.26	25.15	00.049	1439.0	10.06						
12.1	OBS	00010	- 1.12	31.259	25.15		1439.0	10.06	1.07		0.00	00.0	016.	
12.1	OBS	00015	- 1.47	32.086	25.83		1438.6	07.21	0.63		0.00	00.0	025.	
12.1	OBS	00018	- 1.52	32.155	25.89		1438.5	07.13	0.44		0.00	00.0	030.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00015	AIR TEMP 04.4	DIR HGT PER	WIND-DIR 00	INST NANSEN CAST	TEN SQ 1616
CONSEC 0033	MONTH 08	SHIP GL	WET BULB 04.0		WIND-SPD 00	TRACE DIR	5 SQUARE 2
LAT 70 06 N	DAY 08	DATA USE 1	BAROMETR 1012.5	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 145 30 W	HOUR 19.5	AREA 10	CLOUD T/A 3/5	CL/TR	WEATHER X1	ORIG WBS 012	1 SQUARE 05

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.14	21.95	17.52	00.000	1445.7	08.27						
19.5	OBS	00000	03.14	21.948	17.52		1445.7	08.27	0.00		0.07	00.0	002.	
19.5	OBS	00005	02.72	27.160	21.69		1450.9	08.65	0.00		0.13	00.0	003.	
	STD	00010	- 1.39	31.68	25.50	00.063	1438.4	08.83						
19.5	OBS	00010	- 1.39	31.683	25.50		1438.4	08.83	0.06		0.17	00.7	033.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00025	AIR TEMP 04.9	DIR HGT PER	WIND-DIR 15	INST NANSEN CAST	TEN SQ 1616
CONSEC 0034	MONTH 08	SHIP GL	WET BULB 04.4	15 1 2	WIND-SPD 15	TRACE DIR	5 SQUARE 2
LAT 70 13.2N	DAY 08	DATA USE 1	BAROMETR 1011.1	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 145 30.6W	HOUR 22.5	AREA 10	CLOUD T/A 8/5	CL/TR	WEATHER X1	ORIG WBS 013	1 SQUARE 05

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.82	26.68	21.23	00.000	1455.0	08.04						
22.5	OBS	00000	03.82	26.684	21.23		1455.0	08.04	0.00		0.11	00.2	002.	
22.5	OBS	00005	00.54	29.549	23.72		1444.3	09.45	0.00		0.08	01.4	002.	
	STD	00010	- 0.59	30.70	24.69	00.049	1440.8	09.56						
22.5	OBS	00010	- 0.59	30.703	24.69		1440.8	09.56	0.00		0.04	00.6	003.	
22.5	OBS	00015	- 1.14	31.458	25.31		1439.3	10.38	0.00		0.15	00.2	003.	
	STD	00020	- 1.45	32.01	25.76	00.077	1438.7	07.41						
22.5	OBS	00020	- 1.45	32.007	25.76		1438.7	07.41	0.12		0.33	08.6	027.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR	1972	BOTOP	00040	AIR TEMP	06.1	DIR HGT PER		WIND-DIR	12	INST NANSEN CAST		TEN SQ	1616
CONSEC	0035	MONTH	08	SHIP GL		WET BULB	05.0	12 3	2	WIND-SPD	16	TRACE DIR		5 SQUARE	2
LAT	70 23.5N	DAY	09	DATA USE	1	BAROMETR	1008.5	SEA		WIND-FOR		DURATION		2 SQUARE	04
LONG	145 35.0W	HOUR	06.1	AREA	10	CLOUD T/A	6/7	CL/TR		WEATHER	X1	ORIG WBS 014		1 SQUARE	05

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.55	21.25	16.94	00.000	1446.6	08.30						
06.1	OBS	00000	03.55	21.247	16.94		1446.6	08.30	0.00		0.00	00.0	002.	
06.1	OBS	00005	- 0.16	30.248	24.31		1442.0	09.63	0.17		0.00	00.0	002.	
	STD	00010	- 0.90	30.73	24.72	00.070	1439.3	09.74						
06.1	OBS	00010	- 0.90	30.734	24.72		1439.3	09.74	0.23		0.00	00.0	001.	
06.1	OBS	00015	- 1.21	31.343	25.22		1438.8	10.08	0.46		0.00	00.0	001.	
	STD	00020	- 1.43	31.91	25.68	00.097	1438.6	07.97						
06.1	OBS	00020	- 1.43	31.906	25.68		1438.6	07.97	0.34		0.00	00.0	018.	
	STD	00030	- 1.44	32.55	26.20	00.118	1439.7	06.80						
06.1	OBS	00030	- 1.44	32.550	26.20		1439.7	06.80	0.57		0.00	00.0	018.	
06.1	OBS	00035	- 1.44	32.551	26.20		1439.8	06.86	0.19		0.00	00.0	015.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR	1972	BOTOP	00051	AIR TEMP	07.2	DIR HGT PER		WIND-DIR	24	INST NANSEN CAST		TEN SQ	1616
CONSEC	0036	MONTH	08	SHIP GL		WET BULB	07.2	24 4	2	WIND-SPD	21	TRACE DIR		5 SQUARE	2
LAT	70 33.2N	DAY	09	DATA USE	1	BAROMETR	1006.2	SEA		WIND-FOR		DURATION		2 SQUARE	04
LONG	145 39.9W	HOUR	09.8	AREA	10	CLOUD T/A	8/8	CL/TR		WEATHER	X6	ORIG WBS 015		1 SQUARE	05

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	04.50	25.36	20.13	00.000	1456.1	07.93						
09.8	OBS	00000	04.50	25.361	20.13		1456.1	07.83	0.00		0.00	00.0	002.	
09.8	OBS	00005	02.95	27.194	21.70		1451.9	08.36	0.00		0.00	00.0	001.	
	STD	00010	- 0.50	30.08	24.18	00.057	1440.3	09.71						
09.8	OBS	00010	- 0.50	30.080	24.18		1440.3	09.71	0.21		0.14	00.0	001.	
09.8	OBS	00015	- 0.96	30.461	24.50		1438.8	09.96	0.28		0.06	00.0	000.	
	STD	00020	- 1.22	30.63	24.64	00.092	1437.8	10.14						
09.8	OBS	00020	- 1.22	30.626	24.64		1437.8	10.14	0.25		0.00	00.0	000.	
	STD	00030	- 1.42	31.90	25.68	00.120	1438.8	08.48						
09.8	OBS	00030	- 1.42	31.899	25.68		1438.8	08.48	0.41		0.00	00.0	006.	
09.8	OBS	00040	- 1.44	32.221	25.94		1439.4		0.08		0.00	00.0	020.	
09.8	OBS	00045	- 1.42	32.524	26.18		1440.0	07.01	1.32		0.24		034.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR	1972	BOTOP	00093	AIR TEMP	05.6	DIR HGT PER		WIND-DIR	28	INST NANSEN CAST		TEN SQ	1616
CONSEC	0037	MONTH	08	SHIP GL		WET BULB	05.6	24 4	2	WIND-SPD	26	TRACE DIR		5 SQUARE	2
LAT	70 45.5N	DAY	09	DATA USE	1	BAROMETR	1006.5	SEA		WIND-FOR		DURATION		2 SQUARE	04
LONG	145 25.4W	HOUR	14.4	AREA	10	CLOUD T/A	8/8	CL/TR		WEATHER	X5	ORIG WBS 016		1 SQUARE	05

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	01.77	25.75	20.62	00.000	1444.7	08.61						
14.4	OBS	00000	01.77	25.748	20.62		1444.7	08.61	0.30		0.09	00.4	002.	
14.4	OBS	00005	01.76	25.811	20.67		1444.8	08.64	0.27		0.11	00.2	002.	
	STD	00010	- 0.85	29.23	23.51	00.058	1437.5	09.70						
14.4	OBS	00010	- 0.85	29.233	23.51		1437.5	09.70	0.20		0.00	00.0	001.	
14.4	OBS	00015	- 0.92	30.099	24.21		1438.4	09.57	0.38		0.03	00.1	005.	
	STD	00020	- 0.91	30.46	24.50	00.097	1439.1	09.35						
14.4	OBS	00020	- 0.91	30.459	24.50		1439.1	09.35	0.33		0.00	00.0	006.	
	STD	00030	- 1.07	31.00	24.94	00.129	1439.2	09.22						
14.4	OBS	00030	- 1.07	30.997	24.94		1439.2	09.22	0.26		0.00	00.0	006.	
14.4	OBS	00040	- 1.40	31.905	25.68		1439.1	07.82	0.74		0.10	09.5	025.	
	STD	00050	- 1.34	32.38	26.07	00.179	1440.2	07.55						
14.4	OBS	00050	- 1.34	32.384	26.07		1440.2	07.55	0.00		0.00	00.0	024.	
	STD	00075	- 1.35	32.70	26.32	00.225	1441.0	06.89						
14.4	OBS	00075	- 1.35	32.697	26.32		1441.0	06.89	0.16		0.00	00.0	027.	
14.4	OBS	00090	- 1.35	32.700	26.32		1441.3	06.94	1.30		0.15	18.7	039.	

N O D C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTDP 00388	AIR TEMP 01.9	DIR HGT PER	WIND-DIR 26	INST NANSEN CAST	TEN SQ 1616
CONSEC 0036	MONTH 08	SHIP GL	WET BULB 01.9	26 3 2	WIND-SPD 12	TRACE DIR	5 SQUARE 2
LAT 70 55 N	DAY 09	DATA USE 1	BAROMETR 1012.2	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 145 25 W	HOUR 22.2	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X6	ORIG WBS 017	1 SQUARE 05

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	01.42	22.29	17.87	00.000	1438.4	08.22						
22.2	OBS	00000	01.42	22.287	17.87		1438.4	08.22	0.20		0.12	00.5	002.	
22.2	OBS	00005	01.35	22.533	18.07		1438.5	08.29	0.17		0.10	00.0	002.	
	STD	00010	- 1.16	29.03	23.36	00.072	1435.7	09.44						
22.2	OBS	00010	- 1.16	29.035	23.36		1435.7	09.44	0.34		0.00	00.0	003.	
22.2	OBS	00015	- 1.21	29.689	23.88		1436.5	09.40	0.39		0.01	00.6	007.	
	STD	00020	- 1.33	30.23	24.32	00.112	1436.8	09.31						
22.2	OBS	00020	- 1.33	30.229	24.32		1436.8	09.31	0.45		0.08	00.9	005.	
	STD	00030	- 1.45	30.63	24.65	00.147	1436.9	09.13						
22.2	OBS	00030	- 1.45	30.626	24.65		1436.9	09.13	0.55		0.24	01.9	008.	
22.2	OBS	00040	- 1.36	31.385	25.26		1438.6	08.45	0.77		0.19	04.1	010.	
	STD	00050	- 1.31	32.05	25.79	00.202	1439.9	08.34						
22.2	OBS	00050	- 1.31	32.049	25.79		1439.9	08.34	0.99		0.15	08.2	010.	
	STD	00075	- 1.32	32.66	26.29	00.251	1441.1	07.11						
22.2	OBS	00075	- 1.32	32.661	26.29		1441.1	07.11	1.00		0.00	00.5	021.	
	STD	00100	- 1.30	32.80	26.41	00.293	1441.8	07.12						
22.2	OBS	00100	- 1.30	32.805	26.41		1441.8	07.12	1.38		0.12	10.8	034.	
	STD	00125	- 1.05	32.83	26.42	00.334	1443.5	07.31						
22.2	OBS	00125	- 1.05											
	STD	00150	- 1.03	32.95	26.52	00.373	1444.1	07.41						
22.2	OBS	00150	- 1.03	32.951	26.52		1444.1	07.41	1.07		0.17	09.8	024.	
	STD	00200	- 1.21	33.48	26.95	00.438	1444.9	06.73						
22.2	OBS	00200	- 1.21	33.478	26.95		1444.9		1.25		0.02	10.9	017.	
	STD	00250	- 0.31	34.27	27.56	00.479	1451.0	06.34						
	STD	00300	00.22	34.72	27.89	00.498	1454.9	06.24						
22.2	OBS	00300	00.22	34.723	27.89		1454.9	06.24	0.99		0.00	14.0	013.	
22.2	OBS	00350	00.38	34.827	27.97		1456.6	06.42	0.95		0.00	13.3	010.	

N O D C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTOP 01061	AIR TEMP	DIR HGT PER	WIND-DIR 12	INST NANSEN CAST	TEN SQ 1616
CONSEC 0039	MONTH 08	SHIP GL	WET BULB		WIND-SPD 04	TRACE DIR	5 SQUARE 2
LAT 71 02.2N	DAY 10	DATA USE 1	BAROMETR 1014.2	SEA	WIND-FOR	DURATION	2 SQUARE 04
LONG 145 32.0W	HOUR 10.9	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG WBS 018	1 SQUARE 15

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.50	22.73	18.25	00.000	1434.7	08.95						
10.9	OBS	00000	00.50	22.727	18.25		1434.7	08.95	0.00		0.00	00.0	002.	
10.9	OBS	00005	00.41	24.804	19.92		1437.2	09.03	0.15		0.00	00.0	001.	
	STD	00010	00.76	27.74	22.26	00.075	1442.9	09.45						
10.9	OBS	00010	00.76	27.738	22.26		1442.9	09.45	0.22		0.00	00.0	000.	
10.9	OBS	00015	- 1.18	28.805	23.17		1435.4	09.49	0.17		0.00	00.0	000.	
	STD	00020	- 1.14	29.82	23.99	00.123	1437.1	09.31						
10.9	OBS	00020	- 1.14	29.824	23.99		1437.1	09.31	0.39		0.00	00.0	000.	
	STD	00030	- 1.39	30.43	24.49	00.160	1436.9	09.03						
10.9	OBS	00030	- 1.39	30.429	24.49		1436.9	09.03	0.48		0.08	00.6	001.	
10.9	OBS	00040	- 1.51	30.847	24.83		1437.1	08.66	0.61		0.12	03.8	001.	
	STD	00050	- 1.34	31.68	25.50	00.219	1439.2	08.23						
10.9	OBS	00050	- 1.34	31.678	25.50		1439.2	08.23	0.76		0.08	04.9	002.	
	STD	00075	- 1.45	32.52	26.18	00.273	1440.3	07.28						
10.9	OBS	00075	- 1.45	32.523	26.18		1440.3	07.28	0.80		0.00	08.0	011.	
	STD	00100	- 1.46	32.82	26.42	00.316	1441.1	06.83						
10.9	OBS	00100	- 1.46	32.819	26.42		1441.1	06.83	0.91		0.00	12.4	027.	
	STD	00125	- 1.40	33.06	26.62	00.354	1442.1	06.69						
10.9	OBS	00125	- 1.40	33.062	26.62		1442.1	06.69	1.39		0.13	19.5	035.	
	STD	00150	- 1.17	33.33	26.83	00.387	1444.0	07.27						
10.9	OBS	00150	- 1.17	33.333	26.83		1444.0	07.27	1.00		0.00	18.0	023.	
	STD	00200	- 0.91	34.06	27.41	00.434	1447.1	06.13						
10.9	OBS	00200	- 0.91	34.063	27.41		1447.1	06.13	1.20		0.08	17.4	027.	
	STD	00250	- 0.22	34.48	27.72	00.461	1451.7	06.17						
	STD	00300	00.23	34.75	27.91	00.475	1455.0	06.24						
10.9	OBS	00300	00.23	34.750	27.91		1455.0	06.24	0.77		0.03	15.6	012.	
	STD	00400	00.43	34.83	27.97	00.493	1457.7	06.49						
10.9	OBS	00400	00.43	34.835	27.97		1457.7	06.49	0.75		0.08	15.2	011.	
	STD	00500	00.42	34.87	28.00	00.507	1459.3	06.65						
10.9	OBS	00500	00.42	34.868	28.00		1459.3	06.65	0.73		0.00	15.0	007.	
10.9	OBS	00501	00.43	34.862	27.99		1459.4	06.62	0.74		0.02	16.0	005.	
	STD	00600	00.31	34.88	28.01	00.519	1460.5	06.75						
10.9	OBS	00600	00.31	34.877	28.01		1460.5	06.75	0.70		0.00	15.0	006.	
	STD	00700	00.15	34.88	28.03	00.530	1461.5	06.76						
10.9	OBS	00700	00.15	34.885	28.03		1461.5	06.76	0.67		0.01	15.6	007.	
	STD	00800	00.01	34.89	28.03	00.539	1462.5	06.78						
10.9	OBS	00800	00.01	34.82 P	27.980*			06.78	0.70		0.00	15.6	008.	
	STD	00900	- 0.07	34.89	28.04	00.547	1463.8	06.80						
10.9	OBS	00900	- 0.07	34.892	28.04		1463.8		0.75		0.12	15.7	010.	
	STD	01000	- 0.17	34.90	28.06	00.554	1465.0	06.82						
10.9	OBS	01000	- 0.17	34.901	28.06		1465.0	06.82	0.77		0.02	16.0	009.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 01846	AIR TEMP 02.2	DIR HGT PER	WIND-DIR 26	INST NANSEN CAST	TEN SQ 1616
CONSEC 0040	MONTH 08	SHIP GL	WET BULB 02.2		WIND-SPD 07	TRACE DIR	5 SQUARE 2
LAT 71 09 N	DAY 11	DATA USE 1	BAROMETR 1008.0	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 146 29 W	HOUR 12.4	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X6	DRIG WBS 019	1 SQUARE 16

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.69	09.72	07.76	00.000	1411.7	09.16						
12.4	OBS	00000	- 0.69	09.720	07.76		1411.7	09.16	0.87		0.13	00.5	000.	
12.4	OBS	00005	- 0.71	27.959	22.48		1436.3	09.20	0.10		0.13	00.1	000.	
	STD	00010	- 1.11	29.67	23.87	00.118	1436.9	09.34						
12.4	OBS	00010	- 1.11	29.671	23.87		1436.9	09.34	0.20		0.07	00.3	013.	
12.4	OBS	00015	- 1.28	30.066	24.19		1436.7	09.08	0.44		0.10	00.3	013.	
	STD	00020	- 1.35	30.29	24.38	00.157	1436.8	09.05						
12.4	OBS	00020	- 1.35	30.295	24.38		1436.8	09.05	0.33		0.13	00.7	014.	
	STD	00030	- 1.43	30.94	24.90	00.190	1437.5	08.76						
12.4	OBS	00030	- 1.43	30.941	24.90		1437.5	08.76	0.48		0.00	00.0	013.	
12.4	OBS	00040	- 1.33	32.185	25.91		1439.8	07.57	0.42		0.00	00.1	012.	
	STD	00050	- 1.05	32.59	26.22	00.238	1441.9	07.83						
12.4	OBS	00050	- 1.05	32.586	26.22		1441.9	07.83	0.31		0.00	00.2	023.	
	STD	00075	- 0.95	32.73	26.33	00.282	1443.0	07.81						
12.4	OBS	00075	- 0.95	32.727	26.33		1443.0	07.81	0.33		0.32	13.5	033.	
	STD	00100	- 0.56	32.93	26.49	00.322	1445.5	07.98						
12.4	OBS	00100	- 0.56	32.935	26.49		1445.5	07.98	0.76		0.21	18.5	012.	
	STD	00125	- 0.71	33.06	26.59	00.360	1445.4	07.83						
12.4	OBS	00125	- 0.71	33.060	26.59		1445.4	07.83	1.04		0.00	12.0	015.	
	STD	00150	- 0.68	33.13	26.65	00.395	1446.0	07.83						
12.4	OBS	00150	- 0.68	33.134	26.65		1446.0	07.83	0.93		0.33	12.6	016.	
	STD	00200	- 0.78	33.25	26.75	00.463	1446.6	07.71						
12.4	OBS	00200	- 0.78	33.252	26.75		1446.6	07.71	0.83		0.00	12.0	020.	
	STD	00250	- 0.28	34.09	27.41	00.512	1450.9	06.64						
	STD	00300	00.08	34.63	27.83	00.536	1454.1	06.06						
12.4	OBS	00300	00.08	34.632	27.83		1454.1	06.06	1.00		0.32	14.7	016.	
	STD	00400	00.41	34.83	27.97	00.558	1457.6	06.38						
12.4	OBS	00400	00.41	34.832	27.97		1457.6	06.38	0.82		0.17	15.7	015.	
	STD	00500	00.42	34.87	28.00	00.572	1459.3	06.51						
12.4	OBS	00500	00.42	34.868	28.00		1459.3	06.51	0.78		0.07	14.1	006.	
12.4	OBS	00501	00.45	34.859	27.99		1459.5		0.79		0.07	15.7	005.	
	STD	00600	00.36	34.87	28.00	00.584	1460.7	06.61						
12.4	OBS	00600	00.36	34.870	28.00		1460.7	06.61	0.79		0.07	16.2	007.	
	STD	00700	00.25	34.89	28.02	00.596	1461.9	06.67						
12.4	OBS	00700	00.25	34.886	28.02		1461.9	06.67	0.79		0.14	16.5	007.	
	STD	00800	00.11	34.88	28.02	00.606	1462.9	06.69						
12.4	OBS	00800	00.11	34.881	28.02		1462.9	06.69	0.80		0.02	16.5	006.	
	STD	00900	00.00	34.89	28.04	00.614	1464.1	06.71						
12.4	OBS	00900	00.00	34.894	28.04		1464.1	06.71	0.79		0.07	16.7	005.	
	STD	01000	- 0.08	34.90	28.05	00.622	1465.5	06.72						
12.4	OBS	01000	- 0.08	34.898	28.05		1465.5	06.72	0.85		0.07	15.1	007.	
	STD	01100	- 0.16	34.90	28.05	00.629	1466.8	06.71						
	STD	01200	- 0.23	34.89	28.05	00.635	1468.1	06.69						
12.4	OBS	01250	- 0.26	34.893	28.05		1468.8	06.67	0.82		0.07	15.4	008.	
	STD	01300	- 0.28	34.88	28.05	00.641	1469.6	06.64						
	STD	01400	- 0.33	34.88	28.04	00.647	1471.1	06.59						
	STD	01500	- 0.36	34.88	28.04	00.654	1472.6	06.55						
12.4	OBS	01500	- 0.36	34.875	28.04		1472.6	06.55	0.85		0.04	15.0	010.	
	STD	01750	- 0.41	34.91	28.08	00.665	1476.7	06.46						
12.4	OBS	01800	- 0.41	34.926	28.09		1477.6	06.44	0.87		0.05	15.8	010.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00996	AIR TEMP	DIR HGT PER	WIND-DIR 00	INST NANSEN CAST	TEN SQ 1616
CONSEC 0041	MONTH 08	SHIP GL	WET BULB		WIND-SPD 00	TRACE DIR	5 SQUARE 2
LAT 71 03 N	DAY 12	DATA USE 1	BAROMETR 1014.1	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 146 29 W	HOUR 12.7	AREA 10	CLOUD T/A /0	CL/TR	WEATHER X0	ORIG WBS 020	1 SQUARE 16

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.73	24.31	19.54	00.000	1431.1	09.00						
12.7	OBS	00000	- 0.73	24.310	19.54		1431.1	09.00	0.19		0.00	00.0	002.	
12.7	OBS	00005	- 0.96	27.403	22.03		1434.4	09.54	0.00		0.00	00.0	000.	
	STD	00010	- 1.03	28.93	23.27	00.064	1436.2	09.91						
12.7	OBS	00010	- 1.03	28.934	23.27		1436.2	09.91	0.06		0.20	00.1	002.	
12.7	OBS	00015	- 1.24	29.774	23.95		1436.5	09.97	0.25		0.09	00.0	002.	
	STD	00020	- 1.30	30.10	24.22	00.106	1436.7	10.03						
12.7	OBS	00020	- 1.30	30.105	24.22		1436.7	10.03	0.50		0.17	00.0	000.	
	STD	00030	- 1.33	30.61	24.63	00.141	1437.5	09.32						
12.7	OBS	00030	- 1.33	30.608	24.63		1437.5	09.32	0.50		0.32	00.6	005.	
12.7	OBS	00040	- 1.34	31.220	25.12		1438.4	08.97	0.68		0.14	01.2	000.	
	STD	00050	- 1.33	31.98	25.74	00.196	1439.7	08.05						
12.7	OBS	00050	- 1.33	31.985	25.74		1439.7	08.05	0.04		0.01	08.0	011.	
	STD	00075	- 1.24	32.48	26.14	00.248	1441.3	07.87						
12.7	OBS	00075	- 1.24	32.480	26.14		1441.3	07.87	0.09		0.00	09.0	019.	
	STD	00100	- 1.31	32.78	26.39	00.292	1441.8	07.64						
12.7	OBS	00100	- 1.31	32.783	26.39		1441.8	07.64	0.77		0.00	10.0	024.	
	STD	00125	- 1.37	32.94	26.52	00.332	1442.1	07.42						
12.7	OBS	00125	- 1.37	32.938	26.52		1442.1	07.42	1.35		0.29	18.1	027.	
	STD	00150	- 1.10	33.09	26.63	00.368	1444.0	07.36						
12.7	OBS	00150	- 1.10	33.086	26.63		1444.0	07.36	0.79		0.00	14.0	020.	
	STD	00200	- 1.24	33.44	26.92	00.432	1444.7	06.91						
12.7	OBS	00200	- 1.24	33.440	26.92		1444.7	06.91	1.04		0.00	14.0	026.	
	STD	00250	- 0.49	34.15	27.46	00.476	1450.0	06.30						
	STD	00300	00.04	34.61	27.81	00.499	1453.9	06.01						
12.7	OBS	00300	00.04	34.612	27.81		1453.9	06.01	0.73		0.78	13.9	007.	
	STD	00400	00.42	34.82	27.96	00.522	1457.6	06.38						
12.7	OBS	00400	00.42	34.818	27.96		1457.6	06.38	0.35		0.14	15.1	006.	
	STD	00500	00.41	34.86	27.99	00.537	1459.3	06.52						
12.7	OBS	00500	00.41	34.856	27.99		1459.3	06.52	0.82		0.08	15.5	006.	
12.7	OBS	00501	00.46	34.864	27.99		1459.5	06.51	0.85		0.18	15.5	006.	
	STD	00600	00.32	34.88	28.01	00.549	1460.5	06.60						
12.7	OBS	00600	00.32	34.878	28.01		1460.5	06.60	0.90		0.14	15.4	007.	
	STD	00700	00.16	34.89	28.03	00.560	1461.5	06.62						
12.7	OBS	00700	00.16	34.887	28.03		1461.5	06.62	0.83		0.12	15.5	008.	
	STD	00800	00.03	34.89	28.04	00.569	1462.6	06.71						
12.7	OBS	00800	00.03	34.75 P	27.920*			06.71	0.80		0.09	16.0	007.	
	STD	00900	00.05	34.89	28.04	00.577	1464.4	06.69						
12.7	OBS	00900	00.05	34.891	28.04		1464.4	06.69	0.85		0.14	16.8	005.	
12.7	OBS	00975	00.04	34.869	28.02		1465.5	06.70	0.89		0.19	16.2	008.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00464	AIR TEMP -00.1	DIR HGT PER	WIND-DIR 01	INST NANSEN CAST	TEN SQ 1616
CONSEC 0042	MONTH 08	SHIP GL	WET BULB -00.6		WIND-SPD 01	TRACE DIR	5 SQUARE 2
LAT 70 58.3N	DAY 13	DATA USE 1	BAROMETR 1014.9	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 146 30.1W	HOUR 03.2	AREA 10	CLOUD T/A 7/7	CL/TR	WEATHER X1	ORIG WBS 021	1 SQUARE 06

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.39	08.58	06.85	00.000	1411.6	09.41						
03.2	OBS	00000	- 0.39	08.578	06.85		1411.6	09.41						
03.2	OBS	00005	- 1.19	27.652	22.24		1433.6	09.89						
	STD	00010	- 1.22	28.75	23.13	00.127	1435.1	09.97						
03.2	OBS	00010	- 1.22	28.751	23.13		1435.1	09.97	0.48		0.11	00.3	000.	
03.2	OBS	00015	- 1.29	29.178	23.47		1435.4	10.08	0.69		0.16	01.1	000.	
	STD	00020	- 1.30	29.70	23.89	00.170	1436.2	10.19						
03.2	OBS	00020	- 1.30	29.699	23.89		1436.2	10.19	0.00				007.	
	STD	00030	- 1.45	30.38	24.45	00.208	1436.6	10.00						
03.2	OBS	00030	- 1.45	30.382	24.45		1436.6	10.00	0.00		0.13	00.8	008.	
03.2	OBS	00040	- 1.41	31.232	25.14		1438.1	08.72	0.84		0.09	02.2	008.	
	STD	00050	- 1.25	31.78	25.58	00.267	1439.8	08.18						
03.2	OBS	00050	- 1.25	31.783	25.58		1439.8	08.18	0.99		0.14	06.1	009.	
	STD	00075	- 1.37	32.36	26.05	00.322	1440.5	07.34						
03.2	OBS	00075	- 1.37	32.364	26.05		1440.5	07.34	0.14		0.00	00.0	018.	
	STD	00100	- 1.48	32.62	26.26	00.368	1440.7	06.96						
03.2	OBS	00100	- 1.48	32.624	26.26		1440.7	06.96	1.51		0.09	18.4	022.	
	STD	00125	- 1.32	32.80	26.40	00.410	1442.2	07.18						
03.2	OBS	00125	- 1.32	32.802	26.40		1442.2	07.18	1.50		0.23	16.2	025.	
	STD	00150	- 1.07	33.00	26.56	00.449	1444.0	07.40						
03.2	OBS	00150	- 1.07	33.001	26.56		1444.0	07.40	1.38		0.26	13.9	023.	
	STD	00200	- 1.25	33.27	26.78	00.518	1444.4	07.09						
03.2	OBS	00200	- 1.25	33.268	26.78		1444.4	07.09	1.00				039.	
	STD	00250	- 0.48	34.02	27.36	00.567	1449.9	06.40						
	STD	00300	00.05	34.53	27.75	00.594	1453.8	06.04						
03.2	OBS	00300	00.05	34.534	27.75		1453.8	06.04	0.99		0.13	16.7	016.	
	STD	00400	00.36	34.81	27.95	00.620	1457.3	06.31						
03.2	OBS	00400	00.36	34.810	27.95		1457.3	06.31	0.93		0.09	16.0	004.	
03.2	OBS	00450	00.40	34.819	27.96		1458.3	06.67	0.80					

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR	1972	BOTDP	00101	AIR TEMP		DIR HGT PER		WIND-DIR	07	INST	NANSEN CAST			TEN SQ	1616
CONSEC	0043	MONTH	08	SHIP	GL	WET BULB				WIND-SPD	02	TRACE	DIR			5 SQUARE	1
LAT	70 55.5N	DAY	13	DATA USE	1	BAROMETR	1018.8	SEA		WIND-FOR		DURATION				2 SQUARE	02
LONG	143 30.0W	HOUR	11.3	AREA	10	CLOUD T/A	X/9	CL/TR		WEATHER	X4	ORIG	W8S 022			1 SQUARE	03

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.27	05.32	04.21	00.000	1408.0	09.34						
11.3	O8S	00000	- 0.27	05.316	04.21		1408.0	09.34	0.00		0.00	00.0	000.	
11.3	O8S	00005	- 1.22	28.233	22.71		1434.3	09.95	0.30		0.10	00.1	001.	
	STD	00010	- 1.23	29.36	23.62	00.137	1435.9	10.03						
11.3	O8S	00010	- 1.23	29.359	23.62		1435.9	10.03	0.35		0.08	00.1	004.	
11.3	O8S	00015	- 1.36	30.179	24.28		1436.5	10.10	0.10		1.71		000.	
	STD	00020	- 1.41	30.82	24.80	00.174	1437.2	09.53						
11.3	O8S	00020	- 1.41	30.820	24.80		1437.2	09.53	0.10		0.06		000.	
	STD	00030	- 1.16	31.69	25.50	00.203	1439.8	08.81						
11.3	O8S	00030	- 1.16	31.688	25.50		1439.8	08.81	0.75		0.11	01.2	012.	
11.3	O8S	00040	- 0.83	32.147	25.86		1442.1	09.44	0.10		0.00	00.0	018.	
	STD	00050	- 0.88	32.26	25.95	00.248	1442.2	09.45						
11.3	O8S	00050	- 0.88	32.258	25.95		1442.2	09.45	0.39		0.00	00.0	019.	
	STD	00075	- 0.85	32.26	25.96	00.300	1442.8	09.41						
11.3	O8S	00075	- 0.85	32.264	25.96		1442.8	09.41	0.19		0.00	00.0	020.	
11.3	O8S	00095	- 0.83	32.303	25.99		1443.3	09.23	0.73		0.15	01.0	021.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR	1972	BOTDP	00045	AIR TEMP	00.0	DIR HGT PER		WIND-DIR	06	INST	NANSEN CAST			TEN SQ	1616
CONSEC	0044	MONTH	08	SHIP	GL	WET BULB	00.0			WIND-SPD	12	TRACE	DIR			5 SQUARE	2
LAT	70 40 N	DAY	13	DATA USE	1	BAROMETR	1012.3	SEA		WIND-FOR		DURATION				2 SQUARE	06
LONG	146 40 W	HOUR	19.8	AREA	10	CLOUD T/A	6/8	CL/TR		WEATHER	X4	ORIG	W8S 023			1 SQUARE	06

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.13	06.42	05.12	00.000	1410.1	09.34						
19.8	O8S	00000	- 0.13	06.424	05.12		1410.1	09.34	0.00		0.00	00.1	000.	
19.8	O8S	00005	- 0.95	28.992	23.32		1436.6	10.12	0.19		0.00	00.0	004.	
	STD	00010	- 1.20	29.93	24.08	00.131	1436.8	10.14						
19.8	O8S	00010	- 1.20	29.928	24.08		1436.8	10.14	0.00				002.	
19.8	O8S	00015	- 1.31	30.149	24.26		1436.7	10.10	0.12		0.00	00.0	001.	
	STD	00020	- 1.40	30.72	24.72	00.166	1437.1	09.49						
19.8	O8S	00020	- 1.40	30.722	24.72		1437.1	09.49	0.19		0.00	00.0	004.	
	STD	00030	- 0.71	32.29	25.97	00.192	1442.7	08.41						
19.8	O8S	00030	- 0.71	32.291	25.97		1442.7	08.41	0.83		0.08	03.4	006.	
19.8	O8S	00040	- 0.42	32.563	26.18		1444.6	07.94	1.00				014.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR	1972	BOTDP	00036	AIR TEMP	01.6	DIR HGT PER		WIND-DIR	36	INST	NANSEN CAST			TEN SQ	1616
CONSEC	0045	MONTH	08	SHIP	GL	WET BULB	01.4			WIND-SPD	14	TRACE	DIR			5 SQUARE	2
LAT	70 34 N	DAY	14	DATA USE	1	BAROMETR	1006.2	SEA		WIND-FOR		DURATION				2 SQUARE	06
LONG	146 30 W	HOUR	04.0	AREA	10	CLOUD T/A	8/8	CL/TR		WEATHER	X2	ORIG	W8S 024			1 SQUARE	06

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.17	08.69	06.96	00.000	1414.5	09.14						
04.0	O8S	00000	00.17	08.691	06.96		1414.5	09.14	0.78		0.12	00.3	004.	
04.0	O8S	00005	- 0.93	26.663	21.39		1433.4	09.62	0.39		0.10	00.2	002.	
	STD	00010	- 0.99	29.25	23.53	00.124	1436.9	09.88						
04.0	O8S	00010	- 0.99	29.255	23.53		1436.9	09.88	0.47		0.00	00.0	001.	
04.0	O8S	00015	- 1.31	30.627	24.64		1437.3	09.77	0.30		0.00	03.3	002.	
	STD	00020	- 1.36	31.72	25.53	00.158	1438.7	08.70						
04.0	O8S	00020	- 1.36	31.716	25.53		1438.7	08.70	0.80		1.54		010.	
	STD	00030	- 1.19	32.44	26.11	00.180	1440.7	07.71						
04.0	O8S	00030	- 1.19	32.438	26.11		1440.7	07.71	1.16		0.18	03.6	016.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR	1972	BOTDP	00025	AIR TEMP	02.3	DIR HGT PER		WIND-DIR	12	INST	NANSEN CAST			TEN SQ	1616
CONSEC	0046	MONTH	08	SHIP	GL	WET BULB	02.2			WIND-SPD	14	TRACE	DIR			5 SQUARE	2
LAT	70 21.6N	DAY	14	DATA USE	1	BAROMETR	1002.8	SEA		WIND-FOR		DURATION				2 SQUARE	06
LONG	146 30.0W	HOUR	12.7	AREA	10	CLOUD T/A	8/8	CL/TR		WEATHER	X2	ORIG	W8S 025			1 SQUARE	06

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.10	20.23	16.25	00.000	1429.5	08.72						
12.7	O8S	00000	00.10	20.233	16.25		1429.5	08.72	0.00		0.11	00.0	000.	
12.7	O8S	00005	- 0.94	23.327	18.75		1428.8	09.42	0.00		0.00	00.0	001.	
	STD	00010	- 1.45	31.16	25.08	00.071	1437.3	08.05						
12.7	O8S	00010	- 1.45	31.165	25.08		1437.3	08.05	0.72		0.21	03.3	002.	
12.7	O8S	00015	- 1.49	31.298	25.19		1437.4	07.86	0.00				006.	
	STD	00020	- 1.48	31.30	25.20	00.100	1437.6	07.89						
12.7	O8S	00020	- 1.48	31.303	25.20		1437.6	07.89	0.14		0.28	04.7	014.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00016	AIR TEMP 02.1	DIR HGT PER	WIND-DIR 07	INST NANSEN CAST	TEN SQ 1616
CONSEC 0047	MONTH 08	SHIP GL	WET BULB 02.1		WIND-SPD 15	TRACE DIR	5 SQUARE 2
LAT 70 19.6N	DAY 14	DATA USE I	BAROMETR 1001.7	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 146 30.3W	HOUR 16.5	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X4	ORIG WBS 026	1 SQUARE 06

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.13	21.18	17.01	00.000	1430.9	08.68						
16.5	OBS	00000	00.13	21.182	17.01		1430.9	08.68	0.29		0.12	00.0	000.	
16.5	OBS	00005	- 0.90	27.566	22.17		1434.9	09.43	0.00				000.	
	STD	00010	- 1.24	29.38	23.64	00.074	1435.8	09.34						
16.5	OBS	00010	- 1.24	29.380	23.64		1435.8	09.34	0.00		0.00	00.1	008.	
16.5	OBS	00014	- 1.45	30.803	24.79		1436.9	08.57	1.14		0.23	02.6	016.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00015	AIR TEMP 01.8	DIR HGT PER	WIND-DIR 24	INST NANSEN CAST	TEN SQ 1616
CONSEC 0048	MONTH 08	SHIP GL	WET BULB 01.8		WIND-SPD 08	TRACE DIR	5 SQUARE 2
LAT 70 29.2N	DAY 15	DATA USE I	BAROMETR 1000.3	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 37.1W	HOUR 02.8	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X4	ORIG WBS 027	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.06	20.71	16.63	00.000	1429.4	08.91						
02.8	OBS	00000	- 0.06	20.707	16.63		1429.4	08.91	0.66		0.16	01.2	000.	
02.8	OBS	00005	- 0.92	27.895	22.43		1435.2	09.43	0.00		0.12	00.6	000.	
	STD	00010	- 1.20	30.66	24.67	00.071	1437.8	09.13						
02.8	OBS	00010	- 1.20	30.660	24.67		1437.8	09.13	0.18		0.15	00.8	007.	
02.8	OBS	00013	- 1.26	30.880	24.85		1437.9	09.25	0.54		0.00	00.1	013.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00028	AIR TEMP 01.4	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1616
CONSEC 0049	MONTH 08	SHIP GL	WET BULB 01.4		WIND-SPD 02	TRACE DIR	5 SQUARE 2
LAT 70 31.4N	DAY 15	DATA USE I	BAROMETR 1000.5	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 33.1W	HOUR 07.6	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X4	ORIG WBS 028	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.14	20.08	16.13	00.000	1428.2	08.94						
07.6	OBS	00000	- 0.14	20.078	16.13		1428.2	08.94	0.44		0.00	00.3	004.	
07.6	OBS	00005	- 1.11	28.716	23.10		1435.5	09.68	0.30		0.00	00.3	000.	
	STD	00010	- 1.32	30.20	24.30	00.076	1436.6	09.38						
07.6	OBS	00010	- 1.32	30.200	24.30		1436.6	09.38	0.41		0.05	00.6	001.	
07.6	OBS	00015	- 1.32	31.303	25.19		1433.2	08.81	0.04		0.00	00.2	003.	
	STD	00020	- 1.39	31.71	25.52	00.106	1438.6	08.18						
07.6	OBS	00020	- 1.39	31.712	25.52		1438.6	08.18	0.64		0.00	00.2	005.	
07.6	OBS	00025	- 1.43	31.726	25.54		1438.5	08.16	1.47		0.14	04.3	012.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00044	AIR TEMP 02.2	DIR HGT PER	WIND-DIR 12	INST NANSEN CAST	TEN SQ 1616
CONSEC 0050	MONTH 08	SHIP GL	WET BULB 01.7		WIND-SPD 05	TRACE DIR	5 SQUARE 2
LAT 70 42.7N	DAY 15	DATA USE I	BAROMETR 1001.2	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 29.5W	HOUR 14.5	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X1	ORIG WBS 029	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.14	05.00	03.96	00.000	1408.2	09.28						
14.5	OBS	00000	- 0.14	04.996	03.96		1408.2	09.28	0.00		0.24	00.1	000.	
14.5	OBS	00005	- 1.23	26.401	21.23		1431.7	09.60	0.00		0.06	00.0	002.	
	STD	00010	- 1.32	28.78	23.15	00.141	1434.6	09.59						
14.5	OBS	00010	- 1.32	28.779	23.15		1434.6	09.59	0.12		0.06	00.0	000.	
14.5	OBS	00015	- 1.38	30.613	24.63		1437.0	09.51	0.30		0.00	00.0	007.	
	STD	00020	- 1.40	31.16	25.08	00.179	1437.7	09.00						
14.5	OBS	00020	- 1.40	31.161	25.08		1437.7	09.00	0.00				009.	
	STD	00030	- 0.51	32.44	26.09	00.203	1443.9	08.30						
14.5	OBS	00030	- 0.51	32.445	26.09		1443.9	08.30	1.85		0.14	03.9	007.	
14.5	OBS	00040	- 0.49	32.459	26.10		1444.2	08.17	1.89		0.23	03.9	014.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTOP 00055	AIR TEMP 00.8	DIR HGT PER	WIND-DIR 28	INST NANSEN CAST	TEN SQ 1616
CONSEC 0051	MONTH 08	SHIP GL	WET BULB 00.8		WIND-SPD 02	TRACE DIR	5 SQUARE 2
LAT 70 51.5N	DAY 15	DATA USE 1	BAROMETR 1002.1	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 31.0W	HOUR 19.6	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X4	ORIG WBS 030	1 SQUARE 07

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.22	06.64	05.29	00.000	1409.9	09.38						
19.6	OBS	00000	- 0.22	06.637	05.29		1409.9	09.38	0.00		0.00	00.2	000.	
19.6	OBS	00005	- 0.99	28.104	22.60		1435.2	09.87	0.00		0.15	00.0	005.	
	STD	00010	- 1.28	29.40	23.66	00.132	1435.7	09.88						
19.6	OBS	00010	- 1.28	29.405	23.66		1435.7	09.88	0.17		0.13	00.0	005.	
19.6	OBS	00015	- 1.25	30.514	24.55		1437.5	09.88	0.21		0.00	00.0	003.	
	STD	00020	- 1.02	32.09	25.82	00.164	1440.8	09.74						
19.6	OBS	00020	- 1.02	32.092	25.82		1440.8	09.74	0.64		0.19	01.3	021.	
	STD	00030	- 1.04	32.19	25.91	00.185	1441.1	09.79						
19.6	OBS	00030	- 1.04	32.195	25.91		1441.1	09.79						
19.6	OBS	00040	01.06	32.224	25.84 *		1450.9	09.77	0.35		0.00	00.0	007.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTOP 00135	AIR TEMP 00.9	DIR HGT PER	WIND-DIR 31	INST NANSEN CAST	TEN SQ 1616
CONSEC 0052	MONTH 08	SHIP GL	WET BULB 00.9		WIND-SPD 02	TRACE DIR	5 SQUARE 2
LAT 71 02 N	DAY 15	DATA USE 1	BAROMETR 1003.3	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 30 W	HOUR 23.8	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X4	ORIG WBS 031	1 SQUARE 17

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.20	04.69	03.73	00.000	1409.5	09.34						
23.8	OBS	00000	00.20	04.692	03.73		1409.5	09.34	0.00		0.18	00.7	000.	
23.8	OBS	00005	- 1.22	28.353	22.81		1434.4	09.95	0.41		0.09	00.0	000.	
	STD	00010	- 1.26	29.46	23.70	00.139	1435.9	10.08						
23.8	OBS	00010	- 1.26	29.465	23.70		1435.9	10.08	0.46		0.05	00.0	004.	
23.8	OBS	00015	- 1.31	29.769	23.95		1436.1	10.13						
	STD	00020	- 1.30	30.01	24.14	00.179	1436.6	10.05						
23.8	OBS	00020	- 1.30	30.009	24.14		1436.6	10.05	0.53		0.06	00.0	007.	
	STD	00030	- 1.42	30.65	24.66	00.214	1437.1	09.89						
23.8	OBS	00030	- 1.42	30.649	24.66		1437.1	09.89	0.00		0.08	00.0	008.	
23.8	OBS	00040	- 1.32	31.439	25.30		1438.8	09.68	0.00		0.18	06.8	010.	
	STD	00050	- 1.25	31.83	25.62	00.271	1439.9	08.23						
23.8	OBS	00050	- 1.25	31.831	25.62		1439.9	08.23	0.00		0.00	00.0	010.	
	STD	00075	- 0.42	32.06	25.78	00.328	1444.5	09.02						
23.8	OBS	00075	- 0.42	32.064	25.78		1444.5	09.02	0.00		0.00	00.0	015.	
	STD	00100	- 0.96	32.13	25.85	00.383	1442.5	08.34						
23.8	OBS	00100	- 0.96	32.128	25.85		1442.5	08.34	1.21		0.18	05.2	016.	
	STD	00125	- 1.29	32.84	26.43	00.430	1442.3	07.23						
23.8	OBS	00125	- 1.29	32.837	26.43		1442.3	07.23	1.63		0.18	12.0	029.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTOP 00502	AIR TEMP 00.6	DIR HGT PER	WIND-DIR 02	INST NANSEN CAST	TEN SQ 1616
CONSEC 0053	MONTH 08	SHIP GL	WET BULB 00.6		WIND-SPD 06	TRACE DIR	5 SQUARE 2
LAT 71 03.0N	DAY 16	DATA USE	BAROMETR 1006.1	SEA	WIND-FOR	DURATION	2 SQUARE 06
LONG 147 29.6W	HOUR 05.9	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X4	ORIG WBS 032	1 SQUARE 17

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.00	04.04	03.19	00.000	1407.6	09.54						
05.9	OBS	00000	00.00	04.037	03.19		1407.6	09.54	0.00				000.	
05.9	OBS	00005	- 1.31	28.943	23.28		1434.8	10.14	0.00		0.16	00.2	000.	
	STD	00010	- 1.23	29.44	23.68	00.142	1436.0	10.22						
05.9	OBS	00010	- 1.23	29.436	23.68		1436.0	10.22	0.11		0.00	00.0	010.	
05.9	OBS	00015	- 1.38	29.708	23.90		1435.7	10.31	0.29		0.06	00.1	011.	
	STD	00020	- 1.40	30.07	24.20	00.182	1436.2	10.08						
05.9	OBS	00020	- 1.40	30.075	24.20		1436.2	10.08	0.12		0.00	00.0	012.	
	STD	00030	- 1.43	30.65	24.66	00.217	1437.0	09.86						
05.9	OBS	00030	- 1.43	30.646	24.66		1437.0	09.86	0.35		0.00	00.0	010.	
05.9	OBS	00040	- 1.18	31.191	25.10		1439.2	09.59	0.46		0.02	00.0	010.	
	STD	00050	- 0.76	31.83	25.60	00.274	1442.2	09.29						
05.9	OBS	00050	- 0.76	31.828	25.60		1442.2	09.29	0.60		0.11	01.6	008.	
	STD	00075	- 0.68	32.19	25.89	00.330	1443.5	09.68						
05.9	OBS	00075	- 0.68	32.186	25.89		1443.5	09.68	0.67		0.03	01.0	016.	
	STD	00100	- 0.91	32.43	26.09	00.380	1443.2	08.77						
05.9	OBS	00100	- 0.91	32.434	26.09		1443.2	08.77	0.79		0.09	04.1	017.	
	STD	00125	- 1.11	32.59	26.23	00.427	1442.9	08.90						
05.9	OBS	00125	- 1.11	32.593	26.23		1442.9	08.90	0.88		0.16	04.4	021.	
	STD	00150	- 1.26	32.92	26.50	00.468	1443.0	07.60						
05.9	OBS	00150	- 1.26	32.919	26.50		1443.0	07.60	1.12		0.15	11.3	040.	
	STD	00200	- 1.05	33.91	27.29	00.526	1446.2	06.51						
05.9	OBS	00200	- 1.05	33.910	27.29		1446.2	06.51	1.19		0.11	16.6	045.	
	STD	00250	- 0.24	34.32	27.59	00.558	1451.4	06.50						
	STD	00300	00.27	34.62	27.80	00.579	1455.0	06.50						
05.9	OBS	00300	00.27	34.616	27.80		1455.0	06.50	0.74		0.03	16.9	014.	
	STD	00400	00.42	34.85	27.98	00.601	1457.6	06.83						
05.9	OBS	00400	00.42	34.853	27.98		1457.6	06.83	0.65		0.06	17.3	002.	
05.9	OBS	00475	00.33	34.872	28.01		1458.5	06.76	0.83		0.23	16.1	034.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BOTDP 01086	AIR TEMP	00.8	DIR HGT PER		WIND-DIR 21		INST NANSEN CAST				TEN SQ 1616	
CONSEC	0054	MONTH 08	SHIP GL	WET BULB	00.6			WIND-SPD 14		TRACE DIR				5 SQUARE 2	
LAT	71 05.0N	DAY 16	DATA USE 1	BAROMETR	1010.1	SEA		WIND-FOR		DURATION				2 SQUARE 06	
LONG	147 35.0W	HOUR 18.4	AREA 10	CLOUD T/A	7/6	CL/TR		WEATHER	X2	ORIG WBS 033				1 SQUARE 17	

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.29	04.24	03.37	00.000	1409.3	09.38						
18.4	OBS	00000	00.29	04.245	03.37		1409.3	09.38	0.00		0.01	00.0	000.	
18.4	OBS	00005	- 1.30	28.929	23.27		1434.9	09.72	0.49		0.10	00.4	000.	
	STD	00010	- 1.20	29.46	23.70	00.141	1436.2	09.68						
18.4	OBS	00010	- 1.20	29.460	23.70		1436.2	09.68	0.29		0.00	00.1	001.	
18.4	OBS	00015	- 1.41	29.840	24.01		1435.8	09.97	0.56		0.17	00.6	002.	
	STD	00020	- 1.24	30.40	24.46	00.179	1437.4	10.00						
18.4	OBS	00020	- 1.24	30.396	24.46		1437.4	10.00	0.03		0.00	00.1	002.	
	STD	00030	01.41	31.38	25.14	00.211	1451.2	10.08						
18.4	OBS	00030	01.41	31.377	25.14		1451.2	10.08	0.53		0.00	00.3	006.	
18.4	OBS	00040	00.88	31.698	25.42		1449.4	09.29	0.62		0.00	04.0	005.	
	STD	00050	00.72	31.79	25.50	00.264	1448.9	09.30						
18.4	OBS	00050	00.72	31.787	25.50		1448.9	09.30	0.31		0.00	00.2	008.	
	STD	00075	- 0.17	32.15	25.84	00.322	1445.8	09.36						
18.4	OBS	00075	- 0.17	32.150	25.84		1445.8	09.36	0.30		0.10	02.9	010.	
	STD	00100	- 0.81	32.44	26.10	00.373	1443.6	08.95						
18.4	OBS	00100	- 0.81	32.439	26.10		1443.6	08.95	1.36		0.00	00.3	016.	
	STD	00125	- 1.20	32.57	26.21	00.420	1442.4	08.66						
18.4	OBS	00125	- 1.20	32.571	26.21		1442.4	08.66	1.25		0.00	00.4	007.	
	STD	00150	- 1.34	32.75	26.37	00.463	1442.4	08.00						
18.4	OBS	00150	- 1.34	32.754	26.37		1442.4	08.00	1.33		0.28	04.7	020.	
	STD	00200	- 1.14	33.77	27.18	00.527	1445.6	06.51						
18.4	OBS	00200	- 1.14	33.768	27.18		1445.6	06.51	1.52		0.36	10.1	029.	
	STD	00250	- 0.30	34.23	27.52	00.563	1451.0	06.25						
	STD	00300	00.24	34.56	27.76	00.586	1454.7	06.17						
18.4	OBS	00300	00.24	34.560	27.76		1454.7	06.17	0.86		0.26	17.6	035.	
	STD	00400	00.44	34.84	27.97	00.611	1457.7	06.52						
18.4	OBS	00400	00.44	34.838	27.97		1457.7	06.52	0.71		0.00	17.7	012.	
	STD	00500	00.36	34.87	28.00	00.625	1459.0	06.56						
18.4	OBS	00500	00.36	34.867	28.00		1459.0	06.56						

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BOTDP 00955	AIR TEMP		DIR HGT PER		WIND-DIR 03		INST NANSEN CAST				TEN SQ 1616	
CONSEC	0056	MONTH 08	SHIP GL	WET BULB				WIND-SPD 04		TRACE DIR				5 SQUARE 2	
LAT	71 13.0N	DAY 17	DATA USE 1	BAROMETR	1015.2	SEA		WIND-FOR		DURATION				2 SQUARE 08	
LONG	148 29.0W	HOUR 17.4	AREA 10	CLOUD T/A	6/4	CL/TR		WEATHER	X1	ORIG WBS 034				1 SQUARE 18	

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.01	03.93	03.10	00.000	1407.5	09.39						
17.4	OBS	00000	00.01	03.929	03.10		1407.5	09.39	0.71		0.11	00.2	001.	
17.4	OBS	00005	00.10	25.429	20.43		1436.6	08.44	0.48		0.13	00.2	000.	
	STD	00010	00.13	29.33	23.55	00.143	1442.2	09.39						
17.4	OBS	00010	00.13	29.326	23.55		1442.2	09.39	0.43		0.06	00.4	010.	
17.4	OBS	00015	02.95	31.051	24.77		1457.3	08.56	0.59		0.00	00.0	000.	
	STD	00020	02.16	31.22	24.96	00.180	1454.1	08.78						
17.4	OBS	00020	02.16	31.220	24.96		1454.1	08.78	0.41		0.00	00.0	007.	
	STD	00030	01.75	31.36	25.10	00.209	1452.7	09.07						
17.4	OBS	00030	01.75	31.358	25.10		1452.7	09.07	0.48		0.03	00.6	011.	
17.4	OBS	00040	00.88	31.700	25.43		1449.4	09.30	0.59		0.16	01.2	016.	
	STD	00050	00.85	32.17	25.80	00.260	1450.1	09.37						
17.4	OBS	00050	00.85	32.169	25.80		1450.1	09.37	0.05		0.00	00.0	011.	
	STD	00075	00.49	32.42	26.02	00.312	1449.2	09.73						
17.4	OBS	00075	00.49	32.418	26.02		1449.2	09.73	0.10		0.00	00.2	014.	
	STD	00100	- 1.20	32.71	26.33	00.358	1442.2	08.06						
17.4	OBS	00100	- 1.20	32.710	26.33		1442.2	08.06	1.13		0.15	06.8	027.	
	STD	00125	- 1.36	32.91	26.49	00.399	1442.1	06.29						
17.4	OBS	00125	- 1.36	32.911	26.49		1442.1	06.29	0.65		0.00	00.0	021.	
	STD	00150	- 1.53	33.12	26.67	00.435	1442.0	06.92						
17.4	OBS	00150	- 1.53	33.122	26.67		1442.0	06.92	1.48		0.23	11.8	049.	
	STD	00200	- 1.18	33.74	27.16	00.492	1445.4	06.86						
17.4	OBS	00200	- 1.18	33.739	27.16		1445.4	06.86	1.32		0.20	11.5	042.	
	STD	00250	- 0.27	34.24	27.53	00.529	1451.1	06.71						
	STD	00300	00.30	34.60	27.79	00.551	1455.1	06.59						
17.4	OBS	00300	00.30	34.597	27.79		1455.1	06.59	0.25		0.04	10.0	009.	
	STD	00400	00.43	34.84	27.97	00.575	1457.7	06.46						
17.4	OBS	00400	00.43	34.840	27.97		1457.7	06.46	0.75		0.02	12.8	016.	
	STD	00500	00.40	34.86	27.99	00.589	1459.2	06.57						
17.4	OBS	00500	00.40	34.862	27.99		1459.2	06.57	2.26		0.14	12.4	011.	
17.4	OBS	00501	00.42	34.864	27.99		1459.3	06.57	0.77		0.00	17.0	006.	
	STD	00600	00.30	34.87	28.01	00.601	1460.4	06.68						
17.4	OBS	00600	00.30	34.874	28.01		1460.4	06.68	0.97		0.00	17.8	007.	
	STD	00700	00.16	34.88	28.02	00.612	1461.5	06.74						
17.4	OBS	00700	00.16	34.71 P	27.88Q*			06.74	0.72		0.00	18.0	008.	
	STD	00800	00.04	34.89	28.03	00.621	1462.6	06.76						
17.4	OBS	00800	00.04	34.887	28.03		1462.6	06.76	0.72		0.16	17.8	011.	
	STD	00900	- 0.03	34.89	28.04	00.630	1464.0	06.76						
17.4	OBS	00900	- 0.03	34.893	28.04		1464.0	06.76	0.64		0.00	18.0	010.	

N O O C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTOP 00492	AIR TEMP	DIR HGT PER	WIND-DIR 07	INST NANSEN CAST	TEN SQ 1616
CONSEC 0057	MONTH 08	SHIP GL	WET BULB		WIND-SPD 13	TRACE DIR	5 SQUARE 2
LAT 71 13.0N	DAY 18	DATA USE 1	BAROMETR 1019.1	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 34.6W	HOUR 04.9	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X4	ORIG WBS 035	1 SQUARE 18

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.02	14.45	11.60	00.000	1421.4	08.80						
04.9	DBS	00000	00.02	14.448	11.60		1421.4	08.80	0.67		0.14	04.0	002.	
04.9	DBS	00005	00.74	25.901	20.78		1440.2	08.42	0.00		0.00	00.1	000.	
	STD	00010	- 1.27	29.22	23.51	00.101	1435.5	10.06						
04.9	DBS	00010	- 1.27	29.222	23.51		1435.5	10.06	0.00		0.00	00.1	000.	
04.9	DBS	00015	- 0.92	29.874	24.03		1438.1	10.11	0.00		0.00	00.0	000.	
	STD	00020	- 1.21	30.58	24.61	00.140	1437.8	10.02						
04.9	DBS	00020	- 1.21	30.581	24.61		1437.8	10.02	0.17		0.00	00.0	000.	
	STD	00030	02.96	31.51	25.13	00.171	1458.2	08.83						
04.9	DBS	00030	02.96	31.512	25.13		1458.2	08.83	0.49		0.00	00.0	000.	
04.9	DBS	00040	02.34	31.571	25.23		1455.7	08.94	0.19		0.00	00.0	007.	
	STD	00050	01.49	31.97	25.61	00.223	1452.7	09.28						
04.9	DBS	00050	01.49	31.974	25.61		1452.7	09.28	0.34		0.02	02.1	007.	
	STD	00075	- 1.30	32.45	26.12	00.277	1440.9	07.80						
04.9	DBS	00075	- 1.30	32.449	26.12		1440.9	07.80	0.31		0.02	06.1	012.	
	STD	00100	- 1.22	32.72	26.34	00.322	1442.1	07.98						
04.9	DBS	00100	- 1.22	32.725	26.34		1442.1	07.98	1.36		0.02	08.1	011.	
	STD	00125	- 1.36	32.97	26.54	00.361	1442.2	07.33						
04.9	DBS	00125	- 1.36	32.974	26.54		1442.2	07.33	1.36		0.01	10.0	011.	
	STD	00150	- 1.47	33.16	26.70	00.397	1442.4	07.01						
04.9	DBS	00150	- 1.47	33.157	26.70		1442.4	07.01	1.36		0.02	15.1	022.	
	STD	00200	- 1.15	33.79	27.20	00.452	1445.6	06.84						
04.9	DBS	00200	- 1.15	33.791	27.20		1445.6	06.84	0.96		0.02	12.3	033.	
	STD	00250	- 0.21	34.33	27.60	00.486	1451.5	06.55						
	STD	00300	00.36	34.69	27.86	00.505	1455.5	06.39						
04.9	DBS	00300	00.36	34.688	27.86		1455.5	06.39	0.84		0.00	13.0	019.	
	STD	00400	00.41	34.84	27.98	00.525	1457.6	06.48						
04.9	DBS	00400	00.41	34.845	27.98		1457.6	06.48	0.84		0.16	14.3	006.	
04.9	DBS	00480	00.40	34.854	27.99		1458.9	06.52	0.90		0.00	14.1	007.	

N O O C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTOP 00092	AIR TEMP 00.3	DIR HGT PER	WIND-DIR 07	INST NANSEN CAST	TEN SQ 1616
CONSEC 0058	MONTH 08	SHIP GL	WET BULB 00.3	07 1 2	WIND-SPD 11	TRACE DIR	5 SQUARE 2
LAT 71 09 N	DAY 18	DATA USE 1	BAROMETR 1015.1	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 36 W	HOUR 17.2	AREA 10	CLOUD T/A 9/7	CL/TR	WEATHER X4	ORIG WBS 036	1 SQUARE 18

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.16	17.96	14.42	00.000	1425.2	08.65						
17.2	DBS	00000	- 0.16	17.958	14.42		1425.2	08.65	0.06		0.10	00.0	000.	
17.2	DBS	00005	01.12	25.462	20.42		1441.4	08.11	0.32		0.17	00.0	000.	
	STD	00010	04.09	28.48	22.63	00.092	1458.7	08.11						
17.2	DBS	00010	04.09	28.477	22.63		1458.7	08.11	0.11		0.06	00.0	000.	
17.2	DBS	00015	05.98	30.073	23.69		1468.7	07.66	0.32		0.08	00.0	003.	
	STD	00020	01.66	30.62	24.52	00.135	1451.1	09.30						
17.2	DBS	00020	01.66	30.623	24.52		1451.1	09.30	0.43		0.15	00.0	000.	
	STD	00030	02.68	31.40	25.06	00.167	1456.8	09.01						
17.2	DBS	00030	02.68	31.399	25.06		1456.8	09.01	0.67		0.16	00.0	008.	
17.2	DBS	00040	01.13	31.763	25.46		1450.6	09.37	0.67		0.10	00.0	014.	
	STD	00050	00.99	31.92	25.59	00.220	1450.3	09.37						
17.2	DBS	00050	00.99	31.917	25.59		1450.3	09.37	0.73		0.22	00.0	006.	
	STD	00075	- 0.71	32.54	26.17	00.273	1443.8	08.56						
17.2	DBS	00075	- 0.71	32.541	26.17		1443.8	08.56	1.19		0.19	03.9	019.	
17.2	DBS	00085	- 1.22	32.647	26.28		1441.7	07.86	1.32		0.16	06.3	022.	

N O O C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTOP 00049	AIR TEMP 01.6	DIR HGT PER	WIND-DIR 31	INST NANSEN CAST	TEN SQ 1616
CONSEC 0059	MONTH 08	SHIP GL	WET BULB 01.6		WIND-SPD 21	TRACE DIR	5 SQUARE 2
LAT 71 04.5N	DAY 19	DATA USE 1	BAROMETR 1009.1	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 29.2W	HOUR 06.5	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X4	ORIG WBS 037	1 SQUARE 18

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.41	17.41	13.98	00.000	1427.2	08.73						
06.5	DBS	00000	00.41	17.412	13.98		1427.2	08.73	0.15		0.08	00.2	000.	
06.5	DBS	00005	01.55	26.251	21.03		1444.4	08.06	0.00		0.21	00.2	000.	
	STD	00010	06.04	30.14	23.74	00.089	1469.0	07.75						
06.5	DBS	00010	06.04	30.138	23.74		1469.0	07.75	0.52		0.19	00.2	004.	
06.5	DBS	00015	06.37	30.541	24.02		1470.9	07.52	0.56		0.11	00.0	004.	
	STD	00020	05.84	30.70	24.21	00.128	1469.1	07.63						
06.5	DBS	00020	05.84	30.704	24.21		1469.1	07.63	0.65		0.27	00.4	003.	
	STD	00030	03.80	31.14	24.76	00.163	1461.3	08.44						
06.5	DBS	00030	03.80	31.139	24.76		1461.3	08.44	0.76		0.17	00.5	004.	
06.5	DBS	00040	03.16	31.175	24.85		1458.8	08.60	0.80		0.28	00.7	008.	
06.5	DBS	00045	02.52	31.611	25.25		1456.7	09.00	0.95		0.13	00.5	007.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BDTDP 00042	AIR TEMP	01.2	DIR HGT PER		WIND-DIR 07		INST NANSEN CAST		TEN SQ 1616
CONSEC	0060	MONTH 08	SHIP GL	WET BULB	01.2			WIND-SPD 10		TRACE DIR		5 SQUARE 2
LAT	70 57.2N	DAY 19	DATA USE 1	BAROMETR	1006.6	SEA		WIND-FDR		DURATION		2 SQUARE 08
LONG	148 30.0W	HOUR 23.6	AREA 10	CLOUD T/A	X/9	CL/TR		WEATHER	X4	ORIG WBS 038		1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.23	12.73	10.21	00.000	1417.9	09.29						
23.6	OBS	00000	- 0.23	12.732	10.21		1417.9	09.29	0.10		0.11	00.3	000.	
23.6	OBS	00005	- 1.21	27.800	22.36		1433.7	09.77	0.32		0.10	00.0	001.	
	STD	00010	- 1.28	29.62	23.83	00.107	1436.0	09.85						
23.6	OBS	00010	- 1.28	29.623	23.83		1436.0	09.85	0.54		0.03	00.0	001.	
23.6	OBS	00015	- 1.33	30.349	24.42		1436.9	09.82	0.72		0.00	00.0	003.	
	STD	00020	- 1.21	30.88	24.85	00.143	1438.3	09.88						
23.6	OBS	00020	- 1.21	30.882	24.85		1438.3	09.88	0.73		0.02	00.0	004.	
	STD	00030	00.38	31.69	25.44	00.171	1446.9	09.43						
23.6	OBS	00030	00.38	31.689	25.44		1446.9	09.43	0.61		0.13	00.7	004.	
23.6	OBS	00035	00.71	31.844	25.55		1448.7	09.30	0.20		0.07	00.0	008.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BDTDP 00040	AIR TEMP	01.7	DIR HGT PER		WIND-DIR 70		INST NANSEN CAST		TEN SQ 1616
CONSEC	0061	MONTH 08	SHIP GL	WET BULB	01.7			WIND-SPD 15		TRACE DIR		5 SQUARE 2
LAT	70 47.0N	DAY 20	DATA USE 1	BAROMETR	1002.7	SEA		WIND-FDR		DURATION		2 SQUARE 08
LONG	148 30.0W	HOUR 06.7	AREA 10	CLOUD T/A	X/9	CL/TR		WEATHER	X4	ORIG WBS 039		1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.42	15.11	12.13	00.000	1420.1	08.98						
06.7	OBS	00000	- 0.42	15.110	12.13		1420.1	08.98	0.00		0.00	00.0	000.	
06.7	OBS	00005	- 0.97	26.532	21.33		1433.1	09.57	0.00		0.03	00.0	002.	
	STD	00010	- 0.99	30.51	24.54	00.094	1438.6	09.88						
06.7	OBS	00010	- 0.99	30.511	24.54		1438.6	09.88	0.27		0.02	00.0	001.	
06.7	OBS	00015	- 0.74	31.911	25.67		1441.8	09.87	0.31		0.00	00.0	012.	
	STD	00020	- 0.62	31.91	25.67	00.123	1442.5	09.88						
06.7	OBS	00020	- 0.62	31.915	25.67		1442.5	09.88	0.33		0.03	00.0	011.	
	STD	00030	- 0.64	31.93	25.68	00.146	1442.6	09.90						
06.7	OBS	00030	- 0.64	31.930	25.68		1442.6	09.90	0.28		0.06	00.0	012.	
06.7	OBS	00035	- 0.64	31.934	25.68		1442.6	09.85	0.34		0.00	00.0	010.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BDTDP 00027	AIR TEMP	01.2	DIR HGT PER		WIND-DIR 14		INST NANSEN CAST		TEN SQ 1616
CONSEC	0062	MONTH 08	SHIP GL	WET BULB	01.2			WIND-SPD 09		TRACE DIR		5 SQUARE 2
LAT	70 41.8N	DAY 20	DATA USE 1	BAROMETR	1000.0	SEA		WIND-FDR		DURATION		2 SQUARE 08
LONG	148 29.7W	HOUR 13.3	AREA 10	CLOUD T/A	X/9	CL/TR		WEATHER	X6	ORIG WBS 040		1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.28	21.40	17.19	00.000	1429.3	09.97						
13.3	OBS	00000	- 0.28	21.398	17.19		1429.3	09.97	0.11		0.10	00.0	000.	
13.3	OBS	00005	- 1.03	28.746	23.12		1435.9	09.66	0.22		0.09	00.0	001.	
	STD	00010	- 0.97	30.42	24.47	00.070	1438.6	09.81						
13.3	OBS	00010	- 0.97	30.419	24.47		1438.6	09.81	0.38		0.02	00.0	001.	
13.3	OBS	00015	- 0.57	32.035	25.76		1442.8	09.46	0.42		0.12	00.5	011.	
	STD	00020	- 0.50	32.14	25.84	00.098	1443.3	09.37						
13.3	OBS	00020	- 0.50	32.139	25.84		1443.3	09.37	0.32		0.04	00.5	008.	
13.3	OBS	00025	- 0.54	32.149	25.85		1443.2	09.37	0.59		0.08	00.7	008.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BDTDP 00015	AIR TEMP	07.5	DIR HGT PER		WIND-DIR 25		INST NANSEN CAST		TEN SQ 1616
CONSEC	0063	MONTH 08	SHIP GL	WET BULB	06.4			WIND-SPD 13		TRACE DIR		5 SQUARE 2
LAT	70 35.0N	DAY 20	DATA USE 1	BAROMETR	1003.4	SEA		WIND-FDR		DURATION		2 SQUARE 08
LONG	148 41.6W	HOUR 21.5	AREA 10	CLOUD T/A	8/6	CL/TR		WEATHER	X1	ORIG WBS 41A		1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.98	23.67	18.99	00.000	1438.2	08.53						
21.5	OBS	00000	00.98	23.669	18.99		1438.2	08.53	1.43		0.12	00.0	000.	
21.5	OBS	00005	- 0.54	28.234	22.70		1437.5	09.32	0.18		0.16	00.0	002.	
	STD	00010	- 0.90	31.62	25.44	00.056	1440.6	09.23						
21.5	OBS	00010	- 0.90	31.624	25.44		1440.6	09.23	0.00		0.09	00.0	005.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTOP 00015	AIR TEMP 07.2	OIR HGT PER	WIND-OIR 26	INST NANSEN CAST	TEN SQ 1616
CONSEC 0064	MONTH 08	SHIP GL	WET BULB 06.2		WIND-SPD 13	TRACE OIR	5 SQUARE 2
LAT 70 35.0N	OAY 21	OATA USE 1	BAROMETR 1003.9	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 41.6W	HOUR 00.3	AREA 10	CLOUD T/A 8/6	CL/TR	WEATHER X1	ORIG WBS 418	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	00.85	22.94	18.41	00.000	1436.7	08.59						
00.3	OBS	00000	00.85	22.941	18.41		1436.7	08.59	0.29		0.14	00.0	000.	
00.3	OBS	00005	00.11	26.402	21.21		1438.0	09.16	0.06		0.06	00.0	001.	
	STD	00010	- 0.83	31.46	25.30	00.060	1440.7	09.16						
00.3	OBS	00010	- 0.83	31.457	25.30		1440.7	09.16	0.92		0.13	00.0	005.	
00.3	OBS	00015	- 0.86	31.878	25.64		1441.2	09.05	1.31		0.16	00.0	016.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTOP 00015	AIR TEMP 08.9	OIR HGT PER	WIND-DIR 24	INST NANSEN CAST	TEN SQ 1616
CONSEC 0065	MONTH 08	SHIP GL	WET BULB 07.3		WIND-SPD 06	TRACE DIR	5 SQUARE 2
LAT 70 35.0N	DAY 21	DATA USE 1	BAROMETR 1004.2	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 41.6W	HOUR 03.3	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X1	ORIG WBS 41C	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	00.66	22.91	18.39	00.000	1435.7	08.65						
03.3	OBS	00000	00.66	22.914	18.39		1435.7	08.65	0.37		0.22	00.2	000.	
03.3	OBS	00005	- 0.54	27.703	22.27		1436.7	08.32	0.16		0.14	00.0	000.	
	STD	00010	- 0.88	31.26	25.14	00.061	1440.2	09.25						
03.3	OBS	00010	- 0.88	31.258	25.14		1440.2	09.25	0.82		0.18	00.0	004.	
03.3	OBS	00015	- 0.87	31.809	25.59		1441.1	09.01	1.11		0.25	00.0	010.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTOP 00015	AIR TEMP 08.3	OIR HGT PER	WIND-OIR 20	INST NANSEN CAST	TEN SQ 1616
CONSEC 0066	MONTH 08	SHIP GL	WET BULB 07.2		WIND-SPD 02	TRACE DIR	5 SQUARE 2
LAT 70 35.0N	DAY 21	DATA USE 1	BAROMETR 1004.6	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 41.6W	HOUR 06.5	AREA 10	CLOUD T/A 8/7	CL/TR	WEATHER X1	ORIG WBS 410	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	00.60	22.67	18.20	00.000	1435.1	08.61						
06.5	OBS	00000	00.60	22.670	18.20		1435.1	08.61	0.32		0.17	00.0	000.	
06.5	OBS	00005	- 0.34	26.527	21.32		1436.1	09.21	0.06		0.12	00.0	002.	
	STD	00010	- 0.91	31.23	25.13	00.062	1440.0	09.25						
06.5	OBS	00010	- 0.91	31.235	25.13		1440.0	09.25	0.81		0.25	00.0	002.	
06.5	OBS	00015	- 0.88	31.662	25.47		1440.8	09.12	0.92		0.11	00.0	009.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTOP 00015	AIR TEMP 06.7	OIR HGT PER	WIND-DIR 20	INST NANSEN CAST	TEN SQ 1616
CONSEC 0067	MONTH 08	SHIP GL	WET BULB 06.1		WIND-SPD 10	TRACE DIR	5 SQUARE 2
LAT 70 35.0N	DAY 21	DATA USE 1	BAROMETR 1005.4	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 41.6W	HOUR 09.3	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X1	ORIG WBS 41E	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	00.39	22.41	17.99	00.000	1433.8	08.53						
09.3	OBS	00000	00.39	22.408	17.99		1433.8	08.53	0.31		0.21	00.3	000.	
09.3	OBS	00005	- 0.61	27.906	22.43		1436.7	09.29	0.11		0.14	00.0	002.	
	STD	00010	- 0.89	30.99	24.93	00.064	1439.7	09.25						
09.3	OBS	00010	- 0.89	30.987	24.93		1439.7	09.25	0.69		0.20	00.0	004.	
09.3	OBS	00015	- 0.93	31.532	25.37		1440.4	09.10	0.96		0.24	00.0	008.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00015	AIR TEMP 10.0	DIR HGT PER	WIND-DIR 15	INST NANSEN CAST	TEN SQ 1616
CONSEC 0068	MONTH 08	SHIP GL	WET BULB 08.2		WIND-SPD 02	TRACE DIR	5 SQUARE 2
LAT 70 35.0N	DAY 21	DATA USE 1	BAROMETR 1006.0	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 146 41.6W	HOUR 12.3	AREA 10	CLOUD T/A 6/6	CL/TR	WEATHER X1	ORIG W8S 41F	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.27	22.28	17.90	00.000	1433.1	08.46						
12.3	OBS	00000	00.27	22.285	17.90		1433.1	08.46	0.30		0.20	00.0	000.	
12.3	OBS	00005	- 0.64	27.302	21.95		1435.7	09.29	0.02		0.19	00.0	002.	
	STD	00010	- 0.88	30.86	24.82	00.065	1439.6	09.23						
12.3	OBS	00010	- 0.88	30.856	24.82		1439.6	09.23	0.29		0.22	00.0	005.	
12.3	OBS	00015	- 0.94	31.517	25.35		1440.3	09.09	0.94		0.14	00.0	014.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00015	AIR TEMP 05.8	DIR HGT PER	WIND-DIR 15	INST NANSEN CAST	TEN SQ 1616
CONSEC 0069	MONTH 08	SHIP GL	WET BULB 05.4		WIND-SPD 10	TRACE DIR	5 SQUARE 2
LAT 70 35.0N	DAY 21	DATA USE 1	BAROMETR 1006.1	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 41.6W	HOUR 15.3	AREA 10	CLOUD T/A 6/4	CL/TR	WEATHER X1	ORIG W8S 41G	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.76	22.35	17.94	00.000	1435.4	08.38						
15.3	OBS	00000	00.76	22.346	17.94		1435.4	08.38	0.22		0.21	00.0	000.	
15.3	OBS	00005	00.71	28.245	22.66		1443.3	09.41	0.14		0.13	00.0	000.	
	STD	00010	- 0.90	30.83	24.80	00.064	1439.5	09.27						
15.3	OBS	00010	- 0.90	30.834	24.80		1439.5	09.27	0.58		0.19	00.0	013.	
15.3	OBS	00015	- 0.95	31.479	25.32		1440.2	08.98	0.95		0.26	00.0	014.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00015	AIR TEMP 06.1	DIR HGT PER	WIND-DIR 15	INST NANSEN CAST	TEN SQ 1616
CONSEC 0070	MONTH 08	SHIP GL	WET BULB 05.8		WIND-SPD 04	TRACE DIR	5 SQUARE 2
LAT 70 35.0N	DAY 21	DATA USE 1	BAROMETR 1006.2	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 41.6W	HOUR 18.3	AREA 10	CLOUD T/A 4/5	CL/TR	WEATHER X1	ORIG W8S 41H	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.94	22.36	17.94	00.000	1436.3	08.34						
18.3	OBS	00000	00.94	22.362	17.94		1436.3	08.34	0.18		0.19	00.0	000.	
18.3	OBS	00005	- 0.60	28.285	22.74		1437.3	09.23	0.07		0.14	00.0	007.	
	STD	00010	- 0.90	30.92	24.87	00.064	1439.6	09.06						
18.3	OBS	00010	- 0.90	30.918	24.87		1439.6	09.06	0.46		0.20	00.0	013.	
18.3	OBS	00015	- 0.92	31.567	25.39		1440.5	08.94	0.85		0.21	00.0	011.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00015	AIR TEMP 05.6	DIR HGT PER	WIND-DIR 11	INST NANSEN CAST	TEN SQ 1616
CONSEC 0071	MONTH 08	SHIP GL	WET BULB 04.4		WIND-SPD 14	TRACE DIR	5 SQUARE 2
LAT 70 35.0N	DAY 21	DATA USE 1	BAROMETR 1006.9	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 41.6W	HOUR 21.3	AREA 10	CLOUD T/A 2/5	CL/TR	WEATHER X1	ORIG W8S 41I	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.99	22.54	18.08	00.000	1436.8	08.35						
21.3	OBS	00000	00.99	22.538	18.08		1436.8	08.35	0.00		0.20	00.1	000.	
21.3	OBS	00005	- 0.76	28.434	22.86		1436.7	09.28	0.06		0.14	00.0	004.	
	STD	00010	- 0.83	30.91	24.86	00.063	1439.9	09.19						
21.3	OBS	00010	- 0.83	30.907	24.86		1439.9	09.19	0.50		0.18	00.0	009.	
21.3	OBS	00015	- 0.89	31.606	25.43		1440.7	08.98	0.79		0.26	00.0	017.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00015	AIR TEMP 06.1	DIR HGT PER	WIND-DIR 11	INST NANSEN CAST	TEN SQ 1616
CONSEC 0072	MONTH 08	SHIP GL	WET BULB 05.1		WIND-SPD 15	TRACE DIR	5 SQUARE 2
LAT 70 35.0N	DAY 22	DATA USE 1	BAROMETR 1007.1	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 148 41.6W	HOUR 00.5	AREA 10	CLOUD T/A 4/5	CL/TR	WEATHER X1	ORIG WBS 41J	1 SQUARE 08

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.88	22.48	18.06	00.000	1427.9	08.38						
00.5	OBS	00000	- 0.88	22.481	18.06		1427.9	08.38	0.25		0.18	00.1	008.	
00.5	OBS	00005	- 0.97	28.419	22.85		1435.7	09.38	0.56		0.12	00.0	017.	
	STD	00010	- 0.39	31.05	24.96	00.063	1442.2	09.16						
00.5	OBS	00010	- 0.39	31.046	24.96		1442.2	09.16	0.06		0.15	00.0	012.	
00.5	OBS	00015	01.24	31.605	25.33		1450.5	09.04	0.00		0.20	00.0	008.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00028	AIR TEMP 03.0	DIR HGT PER	WIND-DIR 09	INST NANSEN CAST	TEN SQ 1616
CONSEC 0073	MONTH 08	SHIP GL	WET BULB 02.3		WIND-SPD 02	TRACE DIR	5 SQUARE 2
LAT 70 49.5N	DAY 22	DATA USE 1	BAROMETR 1007.6	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 149 30.0W	HOUR 08.5	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X1	ORIG WBS 042	1 SQUARE 09

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	02.83	23.65	18.90	00.000	1446.6	08.14						
08.5	OBS	00000	02.83	23.655	18.90		1446.6	08.14	0.32		0.14	03.6	003.	
08.5	OBS	00005	01.34	26.314	21.09		1443.5	08.82	0.00		0.15	00.2	001.	
	STD	00010	- 0.40	30.99	24.91	00.059	1442.0	09.55						
08.5	OBS	00010	- 0.40	30.991	24.91		1442.0	09.55	0.00		0.14	00.3	004.	
08.5	OBS	00015	00.19	31.532	25.33		1445.6	09.46	0.54		0.08	00.7	007.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00032	AIR TEMP 01.8	DIR HGT PER	WIND-DIR 09	INST NANSEN CAST	TEN SQ 1616
CONSEC 0074	MONTH 08	SHIP GL	WET BULB 01.6		WIND-SPD 07	TRACE DIR	5 SQUARE 2
LAT 70 58 N	DAY 22	DATA USE 1	BAROMETR 1007.9	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 149 30 W	HOUR 14.1	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X1	ORIG WBS 043	1 SQUARE 09

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.45	15.87	12.75	00.000	1425.3	08.83						
14.1	OBS	00000	00.45	15.871	12.75		1425.3	08.83	0.79		0.21	02.0	004.	
14.1	OBS	00005	00.60	26.537	21.30		1440.5	08.73	0.00		0.11	00.0	000.	
	STD	00010	03.38	29.57	23.55	00.096	1457.1	08.23						
14.1	OBS	00010	03.38	29.570	23.55		1457.1	08.23	0.47		0.07	00.0	002.	
14.1	OBS	00015	03.23	30.278	24.13		1457.5	08.40	0.35		0.10	00.0	008.	
	STD	00020	03.82	30.84	24.52	00.134	1460.8	08.21						
14.1	OBS	00020	03.82	30.841	24.52		1460.8	08.21	0.36		0.06	00.0	016.	
14.1	OBS	00025	02.52	31.061	24.81		1455.6	08.49	0.46		0.13	00.2	017.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00045	AIR TEMP 03.7	DIR HGT PER	WIND-DIR 07	INST NANSEN CAST	TEN SQ 1616
CONSEC 0075	MONTH 08	SHIP GL	WET BULB 03.1		WIND-SPD 10	TRACE DIR	5 SQUARE 2
LAT 71 07.8N	DAY 22	DATA USE 1	BAROMETR 1007.5	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 149 37.1W	HOUR 19.2	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG WBS 044	1 SQUARE 19

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	01.14	10.81	08.69	00.000	1421.9	08.90						
19.2	OBS	00000	01.14	10.814	08.69		1421.9	08.90	0.00		0.18	00.0	000.	
19.2	OBS	00005	00.22	25.279	20.30		1437.0	08.70	0.27		0.09	00.1	001.	
	STD	00010	03.65	29.04	23.11	00.118	1457.5	08.13						
19.2	OBS	00010	03.65	29.042	23.11		1457.5	08.13	0.10		0.03	00.0	001.	
19.2	OBS	00015	03.15	30.338	24.18		1457.2	08.62	0.30		0.02	00.0	004.	
	STD	00020	03.52	31.03	24.70	00.158	1459.8	08.33						
19.2	OBS	00020	03.52	31.032	24.70		1459.8	08.33	0.34		0.05	00.2	006.	
	STD	00030	03.40	31.19	24.84	00.190	1459.7	08.49						
19.2	OBS	00030	03.40	31.187	24.84		1459.7	08.49	0.38		0.03	00.0	010.	
19.2	OBS	00040	03.36	31.215	24.86		1459.7	08.44	0.34		0.04	00.4	011.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTDP 00108	AIR TEMP 01.7	DIR HGT PER	WIND-DIR 07	INST NANSEN CAST	TEN SQ 1616
CONSEC 0076	MONTH 08	SHIP GL	WET BULB 01.7		WIND-SPD 09	TRACE DIR	5 SQUARE 2
LAT 71 12.0N	DAY 23	DATA USE 1	BAROMETR 1005.8	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG 149 31.8W	HOUR 04.7	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X4	ORIG W8S 045	1 SQUARE 19

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.99	09.72	07.81	00.000	1419.8	08.89						
04.7	OBS	00000	00.99	09.722	07.81		1419.8	08.89	0.00		0.05	00.0	000.	
04.7	OBS	00005	00.79	25.053	20.10		1439.3	08.35	0.14		0.04	00.0	000.	
	STD	00010	03.49	28.84	22.97	00.123	1456.6	08.17						
04.7	OBS	00010	03.49	28.843	22.97		1456.6	08.17	0.00		0.00	00.0	004.	
04.7	OBS	00015	02.52	30.282	24.19		1454.4	08.92	0.08		0.00	00.0	003.	
	STD	00020	- 1.21	30.27	24.36	00.165	1437.4	09.88						
04.7	OBS	00020	- 1.21	30.272	24.36		1437.4	09.88	0.17		0.01	00.0	006.	
	STD	00030	02.82	31.01	24.75	00.199	1456.9	08.64						
04.7	OBS	00030	02.82	31.013	24.75		1456.9	08.64	0.23		0.02	00.0	007.	
04.7	OBS	00040	03.13	31.125	24.81		1458.6	08.40	0.37		0.09	00.0	010.	
	STD	00050	02.77	31.38	25.04	00.260	1457.5	08.67						
04.7	OBS	00050	02.77	31.382	25.04		1457.5	08.67	0.35		0.06	00.0	010.	
	STD	00075	00.52	32.44	26.04	00.322	1449.4	08.80						
04.7	OBS	00075	00.52	32.441	26.04		1449.4	08.80	0.73		0.09	03.7	006.	
	STD	00100	- 1.11	32.61	26.24	00.369	1442.5	08.11						
04.7	OBS	00100	- 1.11	32.610	26.24		1442.5	08.11	0.93		0.09	09.8	014.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTDP 00018	AIR TEMP 02.0	DIR HGT PER	WIND-DIR 07	INST NANSEN CAST	TEN SQ 1617
CONSEC 0077	MONTH 08	SHIP GL	WET BULB 02.0	07 2 2	WIND-SPD 08	TRACE DIR	5 SQUARE 1
LAT 70 48 N	DAY 23	DATA USE 1	BAROMETR 1002.1	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 04 W	HOUR 18.2	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X4	ORIG W8S 046	1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.83	22.51	17.93	00.000	1449.5	07.80						
18.2	OBS	00000	03.83	22.511	17.93		1449.5	07.80	0.16		0.02	00.0	002.	
18.2	OBS	00005	00.20	29.572	23.75		1442.8	08.93	0.30		0.14	00.0	016.	
	STD	00010	- 0.30	31.41	25.25	00.062	1443.1	09.66						
18.2	OBS	00010	- 0.30	31.412	25.25		1443.1	09.66	0.75		0.21	00.0	018.	
18.2	OBS	00015	- 0.39	31.491	25.32		1442.9	09.50	0.54		0.00	00.0	011.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTDP 00024	AIR TEMP 01.2	DIR HGT PER	WIND-DIR 08	INST NANSEN CAST	TEN SQ 1617
CONSEC 0078	MONTH 08	SHIP GL	WET BULB 01.2	06 2 2	WIND-SPD 19	TRACE DIR	5 SQUARE 1
LAT 70 52.5N	DAY 24	DATA USE 1	BAROMETR 1001.1	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 00.0W	HOUR 02.5	AREA 10	CLOUD T/A 0/4	CL/TR	WEATHER X4	ORIG W8S 047	1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	01.84	23.57	18.88	00.000	1442.0	08.29						
02.5	OBS	00000	01.84	23.572	18.88		1442.0	08.29	0.08		0.02	00.0	002.	
02.5	OBS	00005	01.47	26.315	21.09		1444.1	08.50	0.00		0.00	00.0	001.	
	STD	00010	01.15	29.67	23.78	00.065	1447.3	08.98						
02.5	OBS	00010	01.15	29.666	23.78		1447.3	08.98	0.00		0.10	00.0	000.	
02.5	OBS	00015	01.22	31.073	24.90		1449.7	09.05	0.14		0.11	00.0	005.	
	STD	00020	00.31	31.40	25.22	00.099	1446.1	09.42						
02.5	OBS	00020	00.31	31.403	25.22		1446.1	09.42	0.27		0.20	00.1	007.	

NODC STATION DATA

REFID 31 8328	YEAR 1972	BOTDP 00029	AIR TEMP 00.6	DIR HGT PER	WIND-DIR 04	INST NANSEN CAST	TEN SQ 1617
CONSEC 0079	MONTH 08	SHIP GL	WET BULB 00.9		WIND-SPD 12	TRACE DIR	5 SQUARE 1
LAT 71 00 N	DAY 24	DATA USE 1	BAROMETR 1000.8	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 00 W	HOUR 11.0	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X4	ORIG W8S 048	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.82	19.17	15.39	00.000	1431.5	08.53						
11.0	OBS	00000	00.82	19.171	15.39		1431.5	08.53	0.18		0.14	00.1	002.	
11.0	OBS	00005	00.30	25.719	20.65		1438.0	08.56	0.00		0.00	00.0	001.	
	STD	00010	00.12	29.15	23.41	00.083	1441.9	09.48						
11.0	OBS	00010	00.12	29.149	23.41		1441.9	09.48	0.38		0.09	00.0	002.	
11.0	OBS	00015	00.07	30.474	24.48		1443.6	09.79	0.56		0.08	00.0	005.	
	STD	00020	00.10	31.08	24.96	00.121	1444.6	09.07						
11.0	OBS	00020	00.10	31.077	24.96		1444.6	09.07	0.79		0.06	00.5	003.	
11.0	OBS	00025	00.94	31.270	25.08		1448.8	09.09	0.80		0.07	00.5	008.	

N O O C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00048	AIR TEMP 00.9	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1617
CONSEC 0080	MONTH 08	SHIP GL	WET BULB 00.9	03 2 2	WIND-SPD 10	TRACE DIR	5 SQUARE 1
LAT 71 11 N	DAY 24	DATA USE 1	BAROMETR 1001.0	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 00 W	HOUR 20.9	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X5	ORIG W8S 049	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	01.33	21.05	16.88	00.000	1436.3	08.31						
20.9	OBS	00000		21.048				08.31	0.00		0.14	00.0	002.	
20.9	OBS	00005	01.33											
	STD	00010	05.25	28.70	22.69	00.080	1463.8	07.45						
20.9	OBS	00010	05.25	28.699	22.69		1463.8	07.45	0.00		0.00	00.0	011.	
20.9	OBS	00015	05.76	29.110	22.96		1466.6	07.21	0.03		0.00	00.0	014.	
	STD	00020	05.95	29.35	23.13	00.129	1467.8	07.12						
20.9	OBS	00020	05.95	29.355	23.13		1467.8	07.12	0.26		0.18	00.0	011.	
	STD	00030	06.59	30.38	23.86	00.173	1471.8	07.07						
20.9	OBS	00030	06.59	30.380	23.86		1471.8	07.07	0.25		0.12	00.0	009.	
20.9	OBS	00040	02.63	31.050	24.79		1456.3	08.51	0.26		0.06	00.0	013.	
20.9	OBS	00045	01.59	31.025	24.84		1451.7	08.65	0.58		0.18	00.0	017.	

N O O C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00098	AIR TEMP 00.6	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1617
CONSEC 0081	MONTH 08	SHIP GL	WET BULB 00.6	03 2 2	WIND-SPD 11	TRACE DIR	5 SQUARE 1
LAT 71 12.4N	DAY 25	DATA USE 1	BAROMETR 1001.6	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 01.2W	HOUR 06.2	AREA 10	CLOUD T/A 7/8	CL/TR	WEATHER X4	ORIG W8S 050	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.43	22.79	18.30	00.000	1434.5	08.15						
06.2	OBS	00000	00.43	22.786	18.30		1434.5	08.15	0.21		0.07	00.0	002.	
06.2	OBS	00005	01.53	24.335	19.50		1441.7	08.08	0.33		0.08	00.0	000.	
	STD	00010	03.35	26.45	21.08	00.081	1452.8	07.84						
06.2	OBS	00010	03.35	26.450	21.08		1452.8	07.84	0.00		0.09	00.0	004.	
06.2	OBS	00015	05.06	28.900	22.87		1463.4	07.36	0.09		0.11	00.0	000.	
	STD	00020	04.84	30.62	24.25	00.132	1464.8	07.60						
06.2	OBS	00020	04.84	30.619	24.25		1464.8							
	STD	00030	04.61	31.16	24.70	00.167	1464.8	08.05						
06.2	OBS	00030	04.61	24.39 P	19.35Q*			08.05	0.45		0.17	00.0	003.	
06.2	OBS	00040	03.53	31.496	25.07		1460.8	08.45	0.66		0.11	00.0	006.	
	STD	00050	02.70	31.62	25.24	00.227	1457.5	08.71						
06.2	OBS	00050	02.70	31.622	25.24		1457.5	08.71	0.66		0.16	00.0	014.	
	STD	00075	01.50	31.64	25.34	00.294	1452.7	08.98						
06.2	OBS	00075	01.50	31.641	25.34		1452.7	08.98	0.79		0.14	00.0	015.	
06.2	OBS	00090	- 0.54	32.294	25.97		1444.5	08.71	0.94		0.13	02.0	011.	

N O O C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00507	AIR TEMP 00.8	DIR HGT PER	WIND-DIR 05	INST NANSEN CAST	TEN SQ 1617
CONSEC 0082	MONTH 08	SHIP GL	WET BULB 00.8		WIND-SPD 18	TRACE DIR	5 SQUARE 1
LAT 71 16.1N	DAY 25	DATA USE 1	BAROMETR 1002.5	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 04.1W	HOUR 15.6	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X4	ORIG W8S 051	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	02.07	24.63	19.71	00.000	1444.5	07.97						
15.6	OBS	00000	02.07	24.625	19.71		1444.5	07.97	0.32		0.09	00.0	003.	
15.6	OBS	00005	01.98	24.680	19.76		1444.2	07.95	0.34		0.00	00.0	002.	
	STD	00010	01.73	25.99	20.82	00.075	1445.0	07.94						
15.6	OBS	00010	01.73	25.993	20.82		1445.0	07.94	0.37		0.12	03.8	003.	
15.6	OBS	00015	06.09	29.289	23.06		1468.2	07.07	0.19		0.09	00.0	003.	
	STD	00020	06.64	30.04	23.59	00.131	1471.4	06.87						
15.6	OBS	00020	06.64	30.036	23.59		1471.4	06.87	0.37		0.12	00.0	005.	
	STD	00030	03.29	30.29	24.14	00.172	1458.0	08.08						
15.6	OBS	00030	03.29	30.293	24.14		1458.0	08.08	0.50		0.17	06.0	008.	
15.6	OBS	00040	- 0.69	31.269	25.15		1441.6	09.18	0.80		0.23	07.4	008.	
	STD	00050	00.45	31.96	25.65	00.233	1447.9	09.29						
15.6	OBS	00050	00.45	31.956	25.65		1447.9	09.29	0.54		0.00	10.2	009.	
	STD	00075	- 0.75	32.36	26.03	00.287	1443.4	08.60						
15.6	OBS	00075	- 0.75	32.364	26.03		1443.4	08.60	0.58		0.00	11.8	013.	
	STD	00100	- 0.94	32.58	26.22	00.335	1443.2	08.26						
15.6	OBS	00100	- 0.94	32.584	26.22		1443.2	08.26	0.67		0.02	12.4	022.	
	STD	00125	- 1.34	32.74	26.36	00.378	1442.0	07.45						
15.6	OBS	00125	- 1.34	32.745	26.36		1442.0	07.45	1.83		0.00	15.0	039.	
	STD	00150	- 1.38	33.10	26.65	00.416	1442.7	06.94						
15.6	OBS	00150	- 1.38	33.105	26.65		1442.7	06.94	1.36		0.00	17.0	045.	
	STD	00200	- 0.03	34.63	27.83	00.458	1451.9	05.99						
15.6	OBS	00200	- 0.03	34.628	27.83		1451.9	05.99	0.78		0.00	14.1	022.	
	STD	00250	00.24	34.64	27.83	00.472	1454.0	06.21						
	STD	00300	00.39	34.69	27.85	00.486	1455.6	06.37						
15.6	OBS	00300	00.39	34.686	27.85		1455.6	06.37	0.89		0.37	12.6	018.	
	STD	00400	00.32	34.86	28.00	00.505	1457.2	06.50						
15.6	OBS	00400	00.32	34.861	28.00		1457.2	06.50	0.75		0.29	13.8	012.	
15.6	OBS	00450	00.22	34.876	28.01		1457.6	06.59	0.74		0.00	13.8	014.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BOTOP 01038	AIR TEMP	00.2	DIR HGT PER	WIND-DIR 08	INST NANSEN CAST	TEN SO 1616
CONSEC	0083	MONTH 08	SHIP GL	WET BULB	00.2		WIND-SPD 02	TRACE DIR	5 SQUARE 2
LAT	71 17.9N	DAY 26	DATA USE 1	BAROMETR	1006.2	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG	149 59.0W	HOUR 08.4	AREA 10	CLOUD T/A	X/9	CL/TR	WEATHER X4	ORIG W8S 052	1 SQUARE 19

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.08	21.65	17.39	00.000	1430.6	08.24						
08.4	OBS	00000	- 0.08	21.647	17.39		1430.6	08.24	0.52		0.17	01.2	002.	
08.4	OBS	00005	02.18						0.16		0.24	01.4	003.	
	STD	00010	01.90	26.65	21.33	00.084	1446.6	07.90						
08.4	OBS	00010	01.90	26.650	21.33		1446.6	07.90	0.08		0.37	01.8	008.	
08.4	OBS	00015	05.70	29.646	23.39		1467.0	07.36	0.14		0.19	01.2	012.	
	STD	00020	05.01	30.12	23.84	00.136	1464.9	07.66						
08.4	OBS	00020	05.01	30.119	23.84		1464.9	07.66	0.21		0.19	01.2	013.	
	STD	00030	01.96	30.84	24.67	00.173	1452.9	08.82						
08.4	OBS	00030	01.96	30.840	24.67		1452.9	08.82	0.35		0.20	01.3	010.	
08.4	OBS	00040	01.04	31.298	25.09		1449.6	09.07	0.69		0.42	03.2	018.	
	STD	00050	- 1.18	31.78	25.58	00.230	1440.1	08.24						
08.4	OBS	00050	- 1.18	31.782	25.58		1440.1	08.24	0.63		0.15	08.1	021.	
	STD	00075	- 0.46	32.33	26.00	00.286	1444.7	08.84						
08.4	OBS	00075	- 0.46	32.333	26.00		1444.7	08.84	1.02		0.22	14.5	027.	
	STD	00100	- 1.29	32.67	26.30	00.332	1441.7	07.48						
08.4	OBS	00100	- 1.29	32.674	26.30		1441.7	07.48	1.22		0.49	16.3	043.	
	STD	00125	- 1.31	32.93	26.51	00.373	1442.4	07.09						
08.4	OBS	00125	- 1.31	32.930	26.51		1442.4	07.09	1.81		0.33	15.7	051.	
	STD	00150	- 1.24	34.32	27.63	00.398	1445.1	07.04						
08.4	OBS	00150	- 1.24	34.322	27.63		1445.1	07.04	1.72		0.18	16.2	022.	
	STD	00200	- 0.14	34.58	27.79	00.417	1451.4	05.90						
08.4	OBS	00200	- 0.14	34.578	27.79		1451.4	05.90	0.81		0.42	16.7	015.	
	STD	00250	00.18	34.67	27.85	00.431	1453.8	06.15						
	STD	00300	00.37	34.75	27.90	00.443	1455.6	06.33						
08.4	OBS	00300	00.37	34.750	27.90		1455.6	06.33	0.75		0.40	16.6	018.	
	STD	00400	00.39	34.84	27.98	00.461	1457.5	06.44						
08.4	OBS	00400	00.39	34.844	27.98		1457.5	06.44	0.75		0.20	15.7	010.	
	STD	00500	00.33	34.88	28.01	00.474	1458.9	06.53						
08.4	OBS	00500	00.33	34.880	28.01		1458.9	06.53	0.71		0.17	15.6	007.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BOTOP 01038	AIR TEMP	00.2	DIR HGT PER	WIND-DIR 08	INST NANSEN CAST	TEN SO 1616
CONSEC	0084	MONTH 08	SHIP GL	WET BULB	00.2		WIND-SPD 02	TRACE DIR	5 SQUARE 2
LAT	71 17.9N	DAY 26	DATA USE 1	BAROMETR	1006.2	SEA	WIND-FOR	DURATION	2 SQUARE 08
LONG	149 59.0W	HOUR 14.2	AREA 10	CLOUD T/A	X/9	CL/TR	WEATHER X4	ORIG W8S 52D	1 SQUARE 19

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00500	00.31	34.88	28.01		1458.7	06.56						
14.2	OBS	00500	00.31	34.882	28.01		1458.7	06.56	0.71		0.17	15.6	011.	
	STD	00600	00.14	34.89	28.03		1459.7	06.69						
14.2	OBS	00600	00.14	34.888	28.03		1459.7	06.69	0.72		0.38	16.5	006.	
	STD	00700	- 0.01	34.90	28.05		1460.7	06.69						
14.2	OBS	00700	- 0.01	34.901	28.05		1460.7	06.69	0.76		0.10	15.3	007.	
	STD	00800	- 0.13	34.90	28.05		1461.8	06.70						
14.2	OBS	00800	- 0.13	34.902	28.05		1461.8	06.70	0.63		0.15	15.5	009.	
	STD	00900	- 0.17	34.90	28.05		1463.3	06.69						
14.2	OBS	00900	- 0.17	34.899	28.05		1463.3	06.69	0.67		0.27	16.0	011.	

N O O C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 02130	AIR TEMP 00.7	DIR HGT PER	WIND-DIR 08	INST NANSEN CAST	TEN SQ 1617
CONSEC 0085	MONTH 08	SHIP GL	WET BULB 00.7		WIND-SPD 11	TRACE DIR	5 SQUARE 1
LAT 71 34 N	DAY 27	DATA USE 1	BAROMETR 1012.2	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 01 W	HOUR 03.6	AREA 10	CLOUD T/A X/9	CL/TR	WEATHER X4	ORIG WBS 053	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	- 0.16	21.12	16.97	00.000	1429.5	08.47						
03.6	OBS	00000	- 0.16	21.124	16.97		1429.5	08.47	0.00		0.00	00.0	002.	
03.6	OBS	00005	- 1.08	27.101	21.79		1433.4	09.08	0.16		0.00	00.0	000.	
	STO	00010	- 1.19	29.02	23.34	00.076	1435.6	09.48						
03.6	OBS	00010	- 1.19	29.019	23.34		1435.6	09.48	0.32		0.01	00.0	003.	
03.6	OBS	00015	- 1.19	29.010	23.34		1435.7	09.64	0.41		0.12	00.2	004.	
	STO	00020	- 1.29	30.29	24.37	00.117	1437.0	09.40						
03.6	OBS	00020	- 1.29	30.290	24.37		1437.0	09.40	0.13		0.00	00.0	006.	
	STO	00030	- 0.54	30.86	24.81	00.150	1441.5	09.51						
03.6	OBS	00030	- 0.54	30.859	24.81		1441.5	09.51	0.49		0.10	00.3	008.	
03.6	OBS	00040	- 0.77	31.972	25.72		1442.2	09.17	0.53		0.30	00.9	011.	
	STO	00050	- 0.77	32.12	25.84	00.203	1442.5	08.88						
03.6	OBS	00050	- 0.77	32.122	25.84		1442.5	08.88	0.19		0.00	04.0	008.	
	STO	00075	- 0.80	32.57	26.20	00.253	1443.4	08.90						
03.6	OBS	00075	- 0.80	32.569	26.20		1443.4	08.90	0.84		0.00	07.2	013.	
	STO	00100	- 1.45	32.83	26.43	00.296	1441.2	07.21						
03.6	OBS	00100	- 1.45	32.827	26.43		1441.2	07.21	0.82		0.00	07.8	020.	
	STO	00125	- 1.60	33.02	26.59	00.334	1441.1	06.67						
03.6	OBS	00125	- 1.60	33.017	26.59		1441.1	06.67	1.45		0.36	15.2	041.	
	STO	00150	- 1.58	33.17	26.71	00.369	1441.9	06.80						
03.6	OBS	00150	- 1.58	33.169	26.71		1441.9	06.80	1.35		0.00	14.8	037.	
	STO	00200	- 1.12	33.97	27.34	00.421	1446.0	06.86						
03.6	OBS	00200	- 1.12	33.971	27.34		1446.0	06.86	0.83		0.42	13.2	031.	
	STO	00250	- 0.29	34.37	27.64	00.450	1451.2	06.44						
	STO	00300	00.25	34.65	27.83	00.469	1454.9	06.25						
03.6	OBS	00300	00.25	34.654	27.83		1454.9	06.25	0.81		0.00	13.8	012.	
	STO	00400	00.43	34.84	27.97	00.490	1457.7	06.52						
03.6	OBS	00400	00.43	34.839	27.97		1457.7	06.52	0.76		0.00	14.3	006.	
	STO	00500	00.38	34.86	27.99	00.504	1459.1	06.58						
03.6	OBS	00500	00.38	34.863	27.99		1459.1	06.58	0.74		0.00	14.7	005.	
03.6	OBS	00501	00.40	34.867	28.00		1459.2	06.57	0.72		0.17	15.5	008.	
	STO	00600	00.28	34.88	28.01	00.516	1460.4	06.70						
03.6	OBS	00600	00.28	34.875	28.01		1460.4	06.70	0.70		0.15	15.3	006.	
	STO	00700	00.15	34.89	28.03	00.527	1461.5	06.70						
03.6	OBS	00700	00.15	34.888	28.03		1461.5	06.70	0.74		0.09	15.1	003.	
	STO	00800	00.01	34.89	28.04	00.535	1462.5	06.73						
03.6	OBS	00800	00.01	34.889	28.04		1462.5	06.73	0.72		0.17	15.2	004.	
	STO	00900	00.09	34.89	28.03	00.544	1464.5	06.75						
03.6	OBS	00900	00.09	34.892	28.03		1464.5	06.75	0.76		0.25	15.6	005.	
	STO	01000	- 0.16	34.90	28.05	00.552	1465.1	06.80						
03.6	OBS	01000	- 0.16	34.899	28.05		1465.1	06.80	0.72		0.09	15.9	009.	
	STO	01100	- 0.23					06.81						
	STO	01200	- 0.29					06.82						
03.6	OBS	01250	- 0.31	34.81 P	27.99Q*			06.82	0.78		0.46	15.3	004.	
	STO	01300	- 0.33					06.81						
	STO	01400	- 0.36					06.78						
	STO	01500	- 0.38	34.91	28.08		1472.6	06.75						
03.6	OBS	01500	- 0.38	34.914	28.08		1472.6	06.75	0.87		0.38	14.6	007.	
	STO	01750	- 0.42	34.93	28.09		1476.7	06.64						
03.6	OBS	01900	- 0.42	34.936	28.10		1479.2	06.56	0.91		0.21	15.4	016.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BOTOP 02194	AIR TEMP	00.1	DIR HGT PER	WIND-DIR 15	INST NANSEN CAST	TEN SQ 1617
CONSEC	0086	MONTH 08	SHIP GL	WET BULB	00.1		WIND-SPD 03	TRACE DIR	5 SQUARE 1
LAT	71 41.3N	DAY 28	DATA USE 1	BAROMETR	1012.9	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG	151 02.2W	HOUR 09.0	AREA 10	CLOUD T/A	X/9	CL/TR	WEATHER X4	ORIG WBS 054	1 SQUARE 11

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	01.32	27.28	21.86	00.000	1444.7	08.15						
09.0	OBS	00000	01.32	33.06 P	26.970			08.15	0.15		0.35	01.6	002.	
09.0	OBS	00005	00.94	27.279	21.88 *		1443.0	08.73	0.23		0.31	01.4	006.	
	STO	00010	- 0.96	29.47	23.70	00.051	1437.3	09.47						
09.0	OBS	00010	- 0.96	29.470	23.70		1437.3	09.47	0.43		0.13	00.7	003.	
09.0	OBS	00015	- 1.03	29.955	24.10		1437.7	09.37	0.47		0.11	00.7	003.	
	STO	00020	01.77	31.09	24.88	00.087	1452.2	09.22						
09.0	OBS	00020	01.77	31.088	24.88		1452.2	09.22	0.43		0.38	01.7	011.	
	STO	00030	00.66	31.84	25.55	00.115	1448.4	09.43						
09.0	OBS	00030	00.66	31.836	25.55		1448.4	09.43	0.53		0.15	01.1	017.	
09.0	OBS	00040	- 1.18	32.175	25.89		1440.5	07.77	0.98		0.13	02.9	020.	
	STO	00050	- 1.27	32.40	26.08	00.159	1440.6	07.57						
09.0	OBS	00050	- 1.27	32.399	26.08		1440.6	07.57	1.08		0.15	03.5	023.	
	STO	00075	- 1.13	32.74	26.35	00.204	1442.1	07.95						
09.0	OBS	00075	- 1.13	32.742	26.35		1442.1	07.95	1.04		0.50	04.5	026.	
	STO	00100	- 1.34	32.89	26.48	00.244	1441.8	07.64						
09.0	OBS	00100	- 1.34	32.890	26.48		1441.8	07.64	1.63		0.23	14.0	035.	
	STO	00125	- 1.31	33.01	26.57	00.282	1442.5	07.36						
09.0	OBS	00125	- 1.31	33.007	26.57		1442.5	07.36	1.22		0.31	14.8	039.	
	STO	00150	- 1.24	33.11	26.65	00.318	1443.4	07.32						
09.0	OBS	00150	- 1.24	33.108	26.65		1443.4	07.32	1.25		0.26	14.6	042.	
	STO	00200	- 1.20	33.42	26.90	00.381	1444.8	07.06						
09.0	OBS	00200	- 1.20	33.421	26.90		1444.8	07.06	1.23		0.29	15.0	043.	
	STO	00250	- 0.41	34.15	27.46	00.426	1450.4	06.45						
	STO	00300	00.12	34.63	27.82	00.448	1454.3	06.14						
09.0	OBS	00300	00.12	34.628	27.82		1454.3	06.14	0.78		0.16	15.5	021.	
	STO	00400	00.41	34.82	27.96	00.471	1457.5	06.42						
09.0	OBS	00400	00.41	34.824	27.96		1457.5	06.42	0.74		0.28	15.8	011.	
	STO	00500	00.40	34.86	27.99	00.485	1459.2	06.55						
09.0	OBS	00500	00.40	34.862	27.99		1459.2	06.55	0.73		0.35	16.1	009.	
09.0	OBS	00501	00.43	34.863	27.99		1459.4	06.57	0.70		0.15	15.1	009.	
	STO	00600	00.30	34.87	28.01	00.498	1460.4	06.68						
09.0	OBS	00600	00.30	34.872	28.01		1460.4	06.68	0.78		0.36	16.0	013.	
	STO	00700	00.16	34.88	28.02	00.509	1461.5	06.73						
09.0	OBS	00700	00.16	34.879	28.02		1461.5	06.73	0.76		0.35	16.1	014.	
	STO	00800	00.05	34.89	28.03	00.518	1462.7	06.74						
09.0	OBS	00800	00.05	34.886	28.03		1462.7	06.74	0.78		0.17	15.1	011.	
	STD	00900	- 0.06	34.90	28.05	00.526	1463.9	06.75						
09.0	OBS	00900	- 0.06	34.898	28.05		1463.9	06.75	0.78		0.13	15.0	010.	
	STD	01000	- 0.14	34.90	28.05	00.533	1465.2	06.77						
09.0	OBS	01000	- 0.14	34.900	28.05		1465.2	06.77	0.78		0.23	15.4	011.	
	STO	01100	- 0.21	34.90	28.06	00.539	1466.6	06.76						
	STD	01200	- 0.26	34.90	28.06	00.545	1468.0	06.75						
09.0	OBS	01250	- 0.29	34.907	28.07		1468.7	06.75	0.79		0.17	15.1	012.	
	STO	01300	- 0.31	34.91	26.07	00.549	1469.5	06.75						
	STO	01400	- 0.35	34.92	28.08	00.553	1471.0	06.76						
	STO	01500	- 0.38	34.92	28.08	00.556	1472.6	06.76						
09.0	OBS	01500	- 0.38	34.924	28.08		1472.6	06.76	0.80		0.16	15.3	012.	
	STO	01750	- 0.39	34.94	28.09	00.560	1476.8	06.69						
	STO	02000	- 0.41	34.94	28.10	00.561	1481.0	06.55						
09.0	OBS	02000	- 0.41	34.941	28.10		1481.0	06.55	0.88		0.26	15.9	011.	

N O D C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTOP 00940	AIR TEMP 01.2	DIR HGT PER	WIND-DIR 10	INST NANSEN CAST	TEN SQ 1617
CONSEC 0087	MONTH 08	SHIP GL	WET BULB 01.2	25 2 2	WIND-SPD 12	TRACE DIR	5 SQUARE 1
LAT 71 26.1N	DAY 29	DATA USE 1	BAROMETR 1013.1	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 151 58.3W	HOUR 12.6	AREA 10	CLOUD T/A 7/3	CL/TR	WEATHER X4	ORIG WBS 055	1 SQUARE 11

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	02.36	23.81	19.05	00.000	1444.7	08.11						
12.6	OBS	00000	02.36	23.812	19.05		1444.7	08.11	0.27		0.20	01.1	002.	
12.6	OBS	00005	05.86	28.771	22.68		1466.4	07.43	0.01		0.00	00.2	006.	
	STD	00010	06.62	29.55	23.20	00.067	1470.6	07.07						
12.6	OBS	00010	06.62	29.546	23.20		1470.6	07.07	0.18		0.38	01.6	014.	
12.6	OBS	00015	07.44	30.102	23.53		1474.6	06.78	0.08		0.14	00.9	012.	
	STD	00020	00.59	29.98	24.06	00.109	1445.4	09.49						
12.6	OBS	00020	00.59	29.983	24.06		1445.4	09.49	0.35		0.37	01.7	012.	
	STD	00030	01.01	30.78	24.68	00.145	1448.5	09.11						
12.6	OBS	00030	01.01	30.779	24.68		1448.5	09.11	0.35		0.15	01.0	012.	
12.6	OBS	00040	- 0.82	31.254	25.14		1440.9	09.04	0.31		0.00	00.1	008.	
	STD	00050	- 1.05	31.95	25.71	00.201	1441.0	08.29						
12.6	OBS	00050	- 1.05	31.947	25.71		1441.0	08.29	0.73		0.26	02.5	022.	
	STD	00075	- 0.92	32.43	26.10	00.253	1442.7	08.37						
12.6	OBS	00075	- 0.92	32.434	26.10		1442.7	08.37	0.80		0.02	07.4	015.	
	STD	00100	- 1.17	32.67	26.29	00.299	1442.3	07.88						
12.6	OBS	00100	- 1.17	32.667	26.29		1442.3	07.88	0.91		0.43	04.2	027.	
	STD	00125	- 1.44	32.91	26.49	00.340	1441.7	06.98						
12.6	OBS	00125	- 1.44	32.910	26.49		1441.7	06.98	1.20		0.18	15.3	041.	
	STD	00150	- 1.30	33.23	26.75	00.375	1443.3	06.98						
12.6	OBS	00150	- 1.30	33.230	26.75		1443.3	06.98	1.21		0.28	15.5	043.	
	STD	00200	- 0.30	34.49	27.73	00.417	1450.5	05.98						
12.6	OBS	00200	- 0.30	34.486	27.73		1450.5	05.98	0.81		0.24	16.4	030.	
	STD	00250	00.10	34.69	27.87	00.433	1453.4	06.21						
	STD	00300	00.35	34.82	27.96	00.443	1455.6	06.39						
12.6	OBS	00300	00.35	34.817	27.96		1455.6	06.39	0.84		0.40	16.8	012.	
	STD	00400	00.42	34.85	27.98	00.458	1457.6	06.57						
12.6	OBS	00400	00.42	34.847	27.98		1457.6	06.57	0.75		0.30	16.3	007.	
	STD	00500	00.27	34.88	28.02	00.470	1458.7	06.63						
12.6	OBS	00500	00.27	34.883	28.02		1458.7	06.63	0.73		0.20	15.9	006.	
12.6	OBS	00501	00.24	34.888	28.02		1458.5	06.69	0.70		0.00	11.4	005.	
	STD	00600	00.08	34.89	28.04	00.480	1459.5	06.70						
12.6	OBS	00600	00.08	34.895	28.04		1459.5	06.70	0.70		0.00	11.4	004.	
	STD	00700	- 0.07	34.89	28.04	00.488	1460.5	06.74						
12.6	OBS	00700	- 0.07	34.893	28.04		1460.5	06.74	0.73		0.10	15.7	010.	
	STD	00800	- 0.14	34.89	28.04	00.495	1461.8	06.75						
12.6	OBS	00800	- 0.14	34.890	28.04		1461.8	06.75	0.72		0.30	16.9	009.	
	STD	00900	- 0.18	34.91	28.06	00.502	1463.3	06.74						
12.6	OBS	00900	- 0.18	34.908	28.06		1463.3	06.74	0.71		0.30	16.9	012.	
	STD	01000	- 0.25	34.88	28.04	00.508	1464.7	06.75						
12.6	OBS	01000	- 0.25	34.883	28.04		1464.7	06.75	0.76		0.14	15.7	008.	

N O D C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTOP 00360	AIR TEMP 02.7	DIR HGT PER	WIND-DIR 22	INST NANSEN CAST	TEN SQ 1617
CONSEC 0088	MONTH 08	SHIP GL	WET BULB 02.4	20 2 2	WIND-SPD 03	TRACE DIR	5 SQUARE 1
LAT 71 21.5N	DAY 30	DATA USE 1	BAROMETR 1011.6	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 46.5W	HOUR 05.7	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X6	ORIG WBS 056	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.23	23.42	18.68	00.000	1448.1	08.15						
05.7	OBS	00000	03.23	23.418	18.68		1448.1	08.15	0.31		0.40	01.5	005.	
05.7	OBS	00005	05.02	27.849	22.04		1461.7	07.58	0.23		0.23	00.3	011.	
	STD	00010	05.72	28.53	22.51	00.072	1465.6	07.44						
05.7	OBS	00010	05.72	28.530	22.51		1465.6	07.44	0.00		0.00	00.0	008.	
05.7	OBS	00015	07.14	29.465	23.07		1472.6	06.82	0.23		0.25	00.9	016.	
	STD	00020	06.71	29.99	23.54	00.120	1471.7	06.93						
05.7	OBS	00020	06.71	29.993	23.54		1471.7	06.93	0.23		0.08	00.2	016.	
	STD	00030	07.24	30.59	23.94	00.162	1474.7	06.82						
05.7	OBS	00030	07.24	30.589	23.94		1474.7	06.82	0.24		0.14	00.5	015.	
05.7	OBS	00040	05.97	30.882	24.33		1470.2	07.08	0.27		0.15	00.5	016.	
	STD	00050	- 0.37	30.68	24.66	00.235	1442.4	09.56						
05.7	OBS	00050	- 0.37	30.677	24.66		1442.4	09.56	0.32		0.00	00.0	010.	
	STD	00075	- 0.56	31.96	25.70	00.304	1443.7	08.92						
05.7	OBS	00075	- 0.56	31.963	25.70		1443.7	08.92	0.68		0.50	12.7	019.	
	STD	00100	- 1.10	32.47	26.13	00.357	1442.3	07.94						
05.7	OBS	00100	- 1.10	32.467	26.13		1442.3	07.94	0.98		0.55	14.4	034.	
	STD	00125	- 0.90	33.11	26.64	00.398	1444.6	07.24						
	STD	00150	- 0.71	33.66	27.08	00.428	1446.6	06.69						
	STD	00200	- 0.34	34.45	27.70	00.462	1450.3	05.99						
05.7	OBS	00200	- 0.34	34.449	27.70		1450.3	05.99	0.90		0.45	16.5	021.	
	STD	00250	00.01	34.63	27.83	00.479	1453.0	06.13						
	STD	00300	00.34	34.81	27.96	00.490	1455.6	06.27						
05.7	OBS	00300	00.34	34.813	27.96		1455.6	06.27	0.80		0.00	16.0	021.	

N O D C S T A T I O N D A T A

FID 31 8328	YEAR 1972	BOTDP 00080	AIR TEMP 00.5	DIR HGT PER	WIND-DIR 19	INST NANSEN CAST	TEN SQ 1617
NSEC 0089	MONTH 08	SHIP GL	WET BULB 00.0	20 2 2	WIND-SPD 03	TRACE DIR	5 SQUARE 1
T 71 17.2N	DAY 30	DATA USE 1	BAROMETR 1015.1	SEA	WIND-FOR	DURATION	2 SQUARE 00
NG 150 52.2W	HOUR 19.8	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X7	ORIG WBS 057	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.34	25.33	20.19	00.000	1451.1	07.97						
19.8	OBS	00000	03.34	25.329	20.19		1451.1	07.97	0.26		0.44	00.2	007.	
19.8	OBS	00005	03.80	25.638	20.40		1453.6	07.93	0.29		0.41	00.1	000.	
	STD	00010	05.96	29.57	23.30	00.061	1467.9	07.43						
19.8	OBS	00010	05.96	29.572	23.30		1467.9	07.43	0.16		0.21	00.0	009.	
19.8	OBS	00015	05.86	29.961	23.62		1468.1	07.27	0.26		0.18	00.0	005.	
	STD	00020	07.12	30.54	23.92	00.104	1474.0	06.80						
19.8	OBS	00020	07.12	30.539	23.92		1474.0	06.80	0.90		0.25	00.0	010.	
	STD	00030	03.17	30.61	24.40	00.141	1457.9	08.14						
19.8	OBS	00030	03.17	30.610	24.40		1457.9	08.14	0.98		0.35	00.0	012.	
19.8	OBS	00040	03.01	31.240	24.91		1458.2	08.06	0.70		0.39	00.0	015.	
	STD	00050	02.57	31.35	25.04	00.206	1456.6	08.22						
19.8	OBS	00050	02.57	31.353	25.04		1456.6	08.22	0.74		0.22	00.0	013.	
	STD	00075	00.83	31.83	25.53	00.274	1449.9	08.77						
19.8	OBS	00075	00.83	31.829	25.53		1449.9	08.77	0.98		0.26	00.1	017.	

N O D C S T A T I O N D A T A

FID 31 8328	YEAR 1972	BOTDP 00054	AIR TEMP 01.1	DIR HGT PER	WIND-DIR 14	INST NANSEN CAST	TEN SQ 1617
NSEC 0090	MONTH 08	SHIP GL	WET BULB 00.6	14 2 2	WIND-SPD 03	TRACE DIR	5 SQUARE 1
T 71 12.2N	DAY 31	DATA USE 1	BAROMETR 1010.5	SEA	WIND-FOR	DURATION	2 SQUARE 00
NG 150 00.0W	HOUR 05.4	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X4	ORIG WBS 058	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.88	25.66	20.42	00.000	1453.9	07.79						
05.4	OBS	00000	03.88	25.662	20.42		1453.9	07.79	0.37		0.28	00.0	002.	
05.4	OBS	00005	05.63	28.525	22.51		1465.1	05.60	0.10		0.53	00.0	007.	
	STD	00010	06.37	29.84	23.46	00.059	1469.9	07.20						
05.4	OBS	00010	06.37	29.840	23.46		1469.9	07.20	0.26		0.36	00.0	014.	
05.4	OBS	00015	06.42	30.170	23.72		1470.6	06.95	0.31		0.43	00.0	001.	
	STD	00020	07.21	30.49	23.87	00.101	1474.3	06.34						
05.4	OBS	00020	07.21	30.492	23.87		1474.3	06.34	0.33		0.48	00.0	011.	
	STD	00030	06.12	30.63	24.12	00.141	1470.3	07.09						
05.4	OBS	00030	06.12	30.635	24.12		1470.3	07.09	0.45		0.47	00.0	017.	
05.4	OBS	00040	04.79	30.729	24.34		1465.1	07.61	0.45		0.37	00.0	016.	
	STD	00050	02.11	31.20	24.95	00.209	1454.4	08.40						
05.4	OBS	00050	02.11	31.202	24.95		1454.4	08.40	0.73		0.46	00.3	024.	

N O D C S T A T I O N D A T A

EFID 31 8328	YEAR 1972	BOTDP 00026	AIR TEMP 02.3	DIR HGT PER	WIND-DIR 14	INST NANSEN CAST	TEN SQ 1617
ONSEC 0091	MONTH 08	SHIP GL	WET BULB 01.1		WIND-SPD 12	TRACE DIR	5 SQUARE 1
AT 71 05.5N	DAY 31	DATA USE 1	BAROMETR 1003.9	SEA	WIND-FOR	DURATION	2 SQUARE 00
ONG 150 56.9W	HOUR 15.0	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X1	ORIG WBS 059	1 SQUARE 10

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.41	21.45	17.23	00.000	1428.7	08.51						
15.0	OBS	00000	- 0.41	21.451	17.23		1428.7	08.51	0.00		0.22	00.0	002.	
15.0	OBS	00005	00.94	25.816	20.71		1441.0	08.47	0.42		0.38	00.1	000.	
	STD	00010	06.07	29.51	23.24	00.075	1468.3	07.52						
15.0	OBS	00010	06.07	29.512	23.24		1468.3	07.52	0.14		0.37	00.1	002.	
15.0	OBS	00015	03.55	30.074	23.94		1458.6	08.02	0.36		0.45	00.3	002.	
	STD	00020	04.13	30.33	24.09	00.118	1461.5	07.72						
15.0	OBS	00020	04.13	30.333	24.09		1461.5	07.72	0.43		0.48	00.5	001.	

N O D C S T A T I O N D A T A

EFID 31 8328	YEAR 1972	BOTDP 00015	AIR TEMP 04.4	DIR HGT PER	WIND-DIR 24	INST NANSEN CAST	TEN SQ 1617
ONSEC 0092	MONTH 09	SHIP GL	WET BULB 04.0	06 2 2	WIND-SPD 12	TRACE DIR	5 SQUARE 1
AT 70 52.7N	DAY 01	DATA USE 1	BAROMETR 1003.6	SEA	WIND-FOR	DURATION	2 SQUARE 00
ONG 150 59.9W	HOUR 00.4	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X5	ORIG WBS 060	1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.22	22.86	18.24	00.000	1447.3	08.02						
00.4	OBS	00000	03.22	22.858	18.24		1447.3	08.02	0.14		0.39	00.7	000.	
00.4	OBS	00005	01.33	27.335	21.91		1444.9	08.88	0.00		0.26	00.0	007.	
	STD	00010	00.94	29.85	23.94	00.067	1446.6	09.14						
00.4	OBS	00010	00.94	29.849	23.94		1446.6	09.14	0.35		0.31	00.2	006.	
00.4	OBS	00015	00.82	30.397	24.38		1446.9	09.51	0.41		0.40	00.2	003.	

N O O C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTOP 00019	AIR TEMP 00.6	DIR HGT PER	WIND-DIR 29	INST NANSEN CAST	TEN SQ 1617
CONSEC 0093	MONTH 09	SHIP GL	WET BULB 00.0		WIND-SPD 16	TRACE DIR	5 SQUARE 1
LAT 70 58.8N	DAY 01	DATA USE 1	BAROMETR 1006.5	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 58.0W	HOUR 06.5	AREA 10	CLOUD T/A 8/6	CL/TR	WEATHER X2	ORIG W8S 61A	1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SNO VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	- 0.21	21.90	17.59	00.000	1430.3	08.82						
06.5	OBS	00000	- 0.21	21.896	17.59		1430.3	08.82	0.19		0.42	01.3	000.	
06.5	OBS	00005	00.23	26.224	21.06		1438.3	09.05	0.17		0.37	01.2	007.	
	STO	00010	01.39	28.10	22.51	00.077	1446.3	08.97						
06.5	OBS	00010	01.39	28.098	22.51		1446.3	08.97	0.21		0.49	01.8	007.	
06.5	OBS	00015	02.60	29.817	23.81		1454.1	08.78	0.27		0.33	01.1	007.	

N O O C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTOP 00015	AIR TEMP	DIR HGT PER	WIND-DIR 29	INST NANSEN CAST	TEN SQ 1617
CONSEC 0094	MONTH 09	SHIP GL	WET BULB	30 2 2	WIND-SPD 21	TRACE DIR	5 SQUARE 1
LAT 70 58.8N	DAY 01	DATA USE 1	BAROMETR 1007.4	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 58.0W	HOUR 12.1	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X1	ORIG W8S 618	1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SNO VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	- 0.29	22.42	18.02	00.000	1430.6	08.88						
12.1	OBS	00000	- 0.29	22.424	18.02		1430.6	08.88	0.22		0.30	00.7	001.	
12.1	OBS	00005	00.47	26.414	21.20		1439.7	09.09	0.14		0.62	02.3	009.	
	STO	00010	02.49	29.47	23.54	00.070	1453.0	08.85						
12.1	OBS	00010	02.49	29.468	23.54		1453.0	08.85	0.19		0.44	01.5	008.	
12.1	OBS	00015	02.74	30.205	24.11		1455.2	08.67	0.28		0.20	00.6	006.	

N O O C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTOP 00015	AIR TEMP 01.2	DIR HGT PER	WIND-DIR 32	INST NANSEN CAST	TEN SQ 1617
CONSEC 0095	MONTH 09	SHIP GL	WET BULB	32 2 2	WIND-SPD 24	TRACE DIR	5 SQUARE 1
LAT 70 58.8N	DAY 01	DATA USE 1	BAROMETR 1009.2	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 58.0W	HOUR 15.1	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X1	ORIG W8S 61C	1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SNO VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	00.43	25.33	20.34	00.000	1438.0	08.84						
15.1	OBS	00000	00.43	25.332	20.34		1438.0	08.84	0.25		0.43	01.5	002.	
15.1	OBS	00005	01.53	27.313	21.88		1445.8	08.86	0.12		0.14	00.3	007.	
	STO	00010	05.07	29.67	23.48	00.059	1464.4	08.20						
15.1	OBS	00010	05.07	29.671	23.48		1464.4	08.20	0.17		0.30	00.8	008.	
15.1	OBS	00015	02.19	30.021	24.00		1452.6	08.86	0.24		0.29	00.8	005.	

N O O C S T A T I O N D A T A

REFIO 31 8328	YEAR 1972	BOTOP 00015	AIR TEMP	DIR HGT PER	WIND-DIR 31	INST NANSEN CAST	TEN SQ 1617
CONSEC 0096	MONTH 09	SHIP GL	WET BULB	31 2 2	WIND-SPD 24	TRACE DIR	5 SQUARE 1
LAT 70 58.8N	DAY 01	DATA USE 1	BAROMETR 1012.9	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 58.0W	HOUR 18.5	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG W8S 610	1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SNO VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	00.10	23.88	19.18	00.000	1434.4	08.69						
18.5	OBS	00000	00.10	23.880	19.18		1434.4	08.69	0.11		0.00	00.0	002.	
18.5	OBS	00005	00.51	25.251	20.27		1438.3	08.78	0.13		0.00	00.0	004.	
	STO	00010	02.70	29.53	23.58	00.064	1454.1	08.64						
18.5	OBS	00010	02.70	29.534	23.58		1454.1	08.64	0.17		0.15	00.1	008.	
18.5	OBS	00015	02.07	30.127	24.09		1452.2	08.82	0.25		0.12	00.1	006.	

N O O C S T A T I O N D A T A

REFIO	31 8328	YEAR 1972	BOTOP 00015	AIR TEMP		DIR HGT PER		WIND-DIR 06		INST NANSEN CAST		TEN SQ 1617
CONSEC	0097	MONTH 09	SHIP GL	WET BULB		35 2 3		WIND-SPD 02		TRACE DIR		5 SQUARE 1
LAT	70 58.8N	DAY 01	DATA USE 1	BAROMETR 1019.2		SEA		WIND-FOR		DURATION		2 SQUARE 00
LONG	150 58.0W	HOUR 22.6	AREA 10	CLOUD T/A 6/8		CL/TR		WEATHER X2		ORIG WBS 61E		1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.38	23.55	18.91	00.000	1435.3	08.63						
22.6	OBS	00000	00.38	23.553	18.91		1435.3	08.63	0.15		0.23	00.6	000.	
22.6	OBS	00005	00.34	23.607	18.96		1435.3	08.60	0.27		0.31	00.9	000.	
	STD	00010	03.16	29.14	23.23	00.067	1455.5	08.92						
22.6	OBS	00010	03.16	29.140	23.23		1455.5	08.92	0.00		0.00	00.0	007.	
22.6	OBS	00015	02.82	30.244	24.13		1455.6	08.53	0.23		0.18	00.4	004.	

N O O C S T A T I O N D A T A

REFIO	31 8328	YEAR 1972	BOTOP 00015	AIR TEMP		DIR HGT PER		WIND-DIR 10		INST NANSEN CAST		TEN SQ 1617
CONSEC	0098	MONTH 09	SHIP GL	WET BULB		10 2 2		WIND-SPD 12		TRACE DIR		5 SQUARE 1
LAT	70 58.8N	DAY 02	DATA USE 1	BAROMETR 1019.7		SEA		WIND-FOR		DURATION		2 SQUARE 00
LONG	150 58.8W	HOUR 02.6	AREA 10	CLOUD T/A 6/6		CL/TR		WEATHER X7		ORIG WBS 61F		1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	02.85	23.58	18.84	00.000	1446.6	08.47						
02.6	OBS	00000	02.85	23.582	18.84		1446.6	08.47	0.24		0.00	00.0	006.	
02.6	OBS	00005	04.12	25.655	20.39		1455.0	08.08	0.37		0.00	00.0	008.	
	STD	00010	00.56	30.11	24.16	00.063	1445.2	08.90						
02.6	OBS	00010	00.56	30.107	24.16		1445.2	08.90	0.06		0.01	00.0	009.	
02.6	OBS	00015	00.36	30.267	24.30		1444.6	08.64	0.00		0.00	00.0	009.	

N O O C S T A T I O N D A T A

REFIO	31 8328	YEAR 1972	BOTOP 00015	AIR TEMP	01.2	DIR HGT PER		WIND-DIR 06		INST NANSEN CAST		TEN SQ 1617
CONSEC	0099	MONTH 09	SHIP GL	WET BULB	01.7	35 1 3		WIND-SPD 02		TRACE DIR		5 SQUARE 1
LAT	70 58.6N	DAY 02	DATA USE 1	BAROMETR 1019.2		SEA		WIND-FOR		DURATION		2 SQUARE 00
LONG	150 58.0W	HOUR 06.5	AREA 10	CLOUD T/A 6/8		CL/TR		WEATHER X2		ORIG WBS 61G		1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.09	23.62	18.97	00.000	1434.0	08.80						
06.5	OBS	00000	00.09	23.620	18.97		1434.0	08.80	0.17		0.00	00.0	000.	
06.5	OBS	00005	00.21	23.902	19.20		1435.1	08.79	0.17		0.08	00.0	002.	
	STD	00010	01.48	27.60	22.11	00.072	1446.0	08.98						
06.5	OBS	00010	01.48	27.601	22.11		1446.0	08.98	0.10		0.00	00.0	005.	
06.5	OBS	00015	02.75	30.226	24.13		1455.3	08.58	0.17		0.00	00.0	007.	

N O O C S T A T I O N D A T A

REFIO	31 8328	YEAR 1972	BOTOP 00015	AIR TEMP		DIR HGT PER		WIND-DIR 10		INST NANSEN CAST		TEN SQ 1617
CONSEC	0100	MONTH 09	SHIP GL	WET BULB		10 1 2		WIND-SPD 19		TRACE DIR		5 SQUARE 1
LAT	70 58.8N	DAY 02	DATA USE 1	BAROMETR 1019.7		SEA		WIND-FOR		DURATION		2 SQUARE 00
LONG	150 58.0W	HOUR 10.5	AREA 10	CLOUD T/A 6/6		CL/TR		WEATHER X7		ORIG WBS 61H		1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	00.21	23.92	19.21	00.000	1435.0	08.60						
10.5	OBS	00000	00.21	23.919	19.21		1435.0	08.60	0.12		0.00	00.0	002.	
10.5	OBS	00005	00.50	25.199	20.23		1438.2	08.80	0.15		0.04	00.0	005.	
	STD	00010	02.26	27.88	22.29	00.070	1449.9	08.90						
10.5	OBS	00010	02.26	27.884	22.29		1449.9	08.90	0.06		0.00	00.0	006.	
10.5	OBS	00015	02.68	29.953	23.91		1454.6	08.57	0.16		0.00	00.0	005.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00015	AIR TEMP	DIR HGT PER	WIND-DIR 10	INST NANSEN CAST	TEN SQ 1617
CONSEC 0101	MONTH 09	SHIP GL	WET BULB	10 1 2	WIND-SPD 19	TRACE DIR	5 SQUARE 1
LAT 70 58.8N	DAY 02	DATA USE 1	BAROMETR 1019.6	SEA	WIND-FOR	DURATION	2 SQUARE 00
LONG 150 58.0W	HOUR 14.5	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X7	ORIG W8S 611	1 SQUARE 00

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	- 0.15	23.75	19.08	00.000	1433.1	08.66						
14.5	OBS	00000	- 0.15	23.753	19.08		1433.1	08.66	0.22		0.10	00.0	000.	
14.5	OBS	00005	00.18	25.136	20.19		1436.6	08.91	0.29		0.10	00.0	002.	
	STD	00010	02.54	29.42	23.50	00.065	1453.2	08.67						
14.5	OBS	00010	02.54	29.420	23.50		1453.2	08.67	0.42		0.10	00.0	006.	
14.5	OBS	00015	02.82	29.702	23.70		1454.9	08.55	0.46		0.08	00.0	007.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 02126	AIR TEMP 01.8	DIR HGT PER	WIND-DIR 11	INST NANSEN CAST	TEN SQ 1617
CONSEC 0102	MONTH 09	SHIP GL	WET BULB 01.7	13 3 3	WIND-SPD 18	TRACE DIR	5 SQUARE 1
LAT 71 54.6N	DAY 03	DATA USE 1	BAROMETR 1017.6	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 152 04.7W	HOUR 07.7	AREA 10	CLOUD T/A 6/8	CL/TR	WEATHER X2	ORIG W8S 062	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	02.40	25.47	20.36	00.000	1447.1	07.96						
07.7	OBS	00000	02.40	25.468	20.36		1447.1	07.96	0.23		0.20	00.2	002.	
07.7	OBS	00005	02.99	27.558	21.99		1452.6	07.68	0.15		0.11	00.0	009.	
	STD	00010	00.16	29.28	23.51	00.059	1442.3	09.39						
07.7	OBS	00010	00.16	29.276	23.51		1442.3	09.39	0.37		0.08	00.0	006.	
07.7	OBS	00015	- 0.09	28.18 P	22.64Q*			07.60	0.12		0.30	00.3	013.	
	STD	00020	- 0.09	29.83	23.96	00.101	1442.0	09.51						
07.7	OBS	00020	- 0.09	29.826	23.96		1442.0	09.51	0.37		0.25	00.2	005.	
	STD	00030	- 0.52	30.21	24.29	00.139	1440.7	09.48						
07.7	OBS	00030	- 0.52	30.215	24.29		1440.7	09.48	0.41		0.09	00.0	005.	
07.7	OBS	00040	- 0.97	30.582	24.60		1439.3	09.63	0.46		0.19	00.2	002.	
	STD	00050	- 0.61	30.84	24.80	00.206	1441.5	09.14						
07.7	OBS	00050	- 0.61	32.24 P	25.93Q			09.14	0.61		0.14	06.5	009.	
	STD	00075	- 1.34	31.64	25.46 *	00.277	1439.6	07.54						
07.7	OBS	00075	- 1.34	31.31 P	25.20Q*			07.54	1.06		0.17	08.6	015.	
	STD	00100	- 1.39	32.63	26.27	00.331	1441.2	07.04						
07.7	OBS	00100	- 1.39	32.632	26.27		1441.2	07.04	1.21		0.18	16.7	022.	
	STD	00125	- 1.09	33.83	27.23	00.363	1444.7	06.53						
07.7	OBS	00125	- 1.09	33.831	27.23		1444.7	06.53	1.25		0.22	15.9	044.	
	STD	00150	- 0.79	34.18	27.50	00.381	1447.0	06.32						
07.7	OBS	00150	- 0.79	34.177	27.50		1447.0	06.32	1.11		0.17	15.5	040.	
	STD	00200	- 0.04	34.62	27.82	00.403	1451.9	06.16						
07.7	OBS	00200	- 0.04	34.620	27.82		1451.9	06.16	0.93		0.26	15.0	027.	
	STD	00250	00.22	34.68	27.86	00.417	1454.0	06.33						
	STD	00300	00.38	34.73	27.89	00.429	1455.6	06.45						
07.7	OBS	00300	00.38	34.730	27.89		1455.6	06.45	0.75		0.09	15.0	008.	
	STD	00400	00.42	34.81	27.95	00.449	1457.6	06.54						
07.7	OBS	00400	00.42	34.813	27.95		1457.6	06.54	0.75		0.09	14.3	004.	
	STD	00500	00.34	34.88	28.01	00.463	1459.0	06.63						
07.7	OBS	00500	00.34	34.880	28.01		1459.0	06.63	0.72		0.17	14.6	006.	
07.7	OBS	00501	00.40	34.863	27.99		1459.2	06.50	0.76		0.20	14.8		
	STD	00600	00.33	34.88	28.01	00.474	1460.6	06.62						
07.7	OBS	00600	00.33	34.878	28.01		1460.6	06.62	0.72		0.23	14.0		
	STD	00700	00.23	34.88	28.02	00.485	1461.8	06.69						
07.7	OBS	00700	00.23	34.883	28.02		1461.8	06.69	0.72		0.10	14.6		
	STD	00800	00.10	34.89	28.03	00.495	1462.9	06.72						
07.7	OBS	00800	00.10	34.888	28.03		1462.9	06.72	0.72		0.12	14.8		
	STD	00900	00.01	34.89	28.04	00.503	1464.2	06.77						
07.7	OBS	00900	00.01	34.893	28.04		1464.2	06.77	0.72		0.07	14.8		
	STD	01000	- 0.10	34.90	28.05	00.511	1465.4	06.81						
07.7	OBS	01000	- 0.10	34.899	28.05		1465.4	06.81	0.74		0.11	14.8		
	STD	01100	- 0.17	34.88	28.04	00.518	1466.7	06.80						
	STD	01200	- 0.22	34.87	28.03	00.526	1468.1	06.80						
07.7	OBS	01250	- 0.25	34.862	28.03		1468.8	06.80	0.72		0.09	14.8		
	STD	01300	- 0.27	34.88	28.04	00.533	1469.6	06.80						
	STD	01400	- 0.31	34.90	28.06	00.539	1471.2	06.81						
	STD	01500	- 0.34	34.92	28.08	00.543	1472.8	06.81						
07.7	OBS	01500	- 0.34	34.919	28.08		1472.8	06.81	0.83		0.06	14.0		
	STD	01750	- 0.40	34.92	28.08	00.549	1476.7	06.74						
07.7	OBS	01800	- 0.41	34.923	28.08		1477.6	06.71	0.86		0.04	14.5		

N O O C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 01046	AIR TEMP 02.6	DIR HGT PER	WIND-DIR 07	INST NANSEN CAST	TEN SQ 1617
CONSEC 0103	MONTH 09	SHIP GL	WET BULB 02.6	09 3 2	WIND-SPD 11	TRACE DIR	5 SQUARE 1
LAT 71 39.7N	DAY 04	DATA USE 1	BAROMETR 1015.6	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 152 03.0W	HOUR 03.6	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X4	ORIG WBS 063	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.03	26.11	20.83	00.000	1450.8	07.96						
03.6	OBS	00000	03.03	26.110	20.83		1450.8	07.96	0.00		0.00	00.0	006.	
03.6	OBS	00005	05.32	28.673	22.66		1464.0	07.42	0.15		0.18	00.4	010.	
	STD	00010	04.38	29.03	23.03	00.059	1460.6	07.90						
03.6	OBS	00010	04.38	29.026	23.03		1460.6	07.90	0.22		0.10	00.2	005.	
03.6	OBS	00015	04.08	29.222	23.22		1459.7	08.01	0.11		0.00	00.0	009.	
	STD	00020	03.28	29.62	23.60	00.105	1456.9	08.26						
03.6	OBS	00020	03.28	29.624	23.60		1456.9	08.26	0.20		0.13	00.2	012.	
	STD	00030	00.16	30.35	24.37	00.144	1444.1	09.33						
03.6	OBS	00030	00.16	30.347	24.37		1444.1	09.33	0.35		0.08	00.1	003.	
03.6	OBS	00040	- 0.83	30.949	24.89		1440.5	09.49	0.47		0.08	00.2	014.	
	STD	00050	- 0.61	31.80	25.57	00.204	1442.8	08.93						
03.6	OBS	00050	- 0.61	31.797	25.57		1442.8	08.93	0.69		0.22	01.1	018.	
	STD	00075	- 1.09	32.45	26.12	00.258	1441.9	08.39						
03.6	OBS	00075	- 1.09	32.453	26.12		1441.9	08.39	0.80		0.00	00.0	018.	
	STD	00100	- 1.29	32.76	26.37	00.302	1441.8	07.58						
03.6	OBS	00100	- 1.29	32.762	26.37		1441.8	07.58	1.08		0.18	02.8	029.	
	STD	00125	- 1.62	33.06	26.62	00.341	1441.1	06.61						
03.6	OBS	00125	- 1.62	33.059	26.62		1441.1	06.61	1.41		0.32	15.3	043.	
	STD	00150	- 1.43	33.31	26.82	00.374	1442.8	06.78						
03.6	OBS	00150	- 1.43	33.310	26.82		1442.8	06.78	1.34		0.32	15.3	034.	
	STD	00200	- 0.31	34.46	27.71	00.414	1450.4	06.02						
03.6	OBS	00200	- 0.31	34.461	27.71		1450.4	06.02	0.94		0.17	15.5	038.	
	STD	00250	00.09	34.57	27.77	00.433	1453.3	06.20						
	STD	00300	00.35	34.66	27.83	00.448	1455.4	06.34						
03.6	OBS	00300	00.35	34.660	27.83		1455.4	06.34	0.75		0.13	15.2	023.	
	STD	00400	00.43	34.80	27.95	00.471	1457.6	06.50						
03.6	OBS	00400	00.43	34.805	27.95		1457.6	06.50	0.70		0.23	15.6	012.	
	STD	00500	00.38	34.87	28.00	00.486	1459.1	06.57						
03.6	OBS	00500	00.38	34.868	28.00		1459.1	06.57	0.78		0.19	15.1	008.	
03.6	OBS	00501	00.41	34.852	27.98		1459.3	06.50	0.73		0.18	15.6	011.	
	STD	00600	00.39	34.87	28.00	00.498	1460.8	06.80						
03.6	OBS	00600	00.39	34.869	28.00		1460.8	06.80	0.78		0.15	15.2	012.	
	STD	00700	00.31	34.88	28.02	00.510	1462.2	06.68						
03.6	OBS	00700	00.31	34.885	28.02		1462.2	06.68	0.78		0.20	15.5	016.	
	STD	00800	00.24	34.88	28.01	00.521	1463.5	06.60						
03.6	OBS	00800	00.24	34.64 P	27.820*			06.60	0.71		0.14	15.5	015.	
	STD	00900	00.16	34.88	28.02	00.531	1464.8	06.70						
03.6	OBS	00900	00.16	34.877	28.02		1464.8	06.70	0.76		0.15	15.6	014.	
	STD	01000	00.00	34.88	28.03	00.541	1465.8	06.75						
03.6	OBS	01000	00.00	34.883	28.03		1465.8	06.75	0.78		0.22	15.8	012.	

N O O C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00684	AIR TEMP 02.8	DIR HGT PER	WIND-DIR 09	INST NANSEN CAST	TEN SQ 1617
CONSEC 0104	MONTH 09	SHIP GL	WET BULB 02.5	10 3 2	WIND-SPD 20	TRACE DIR	5 SQUARE 1
LAT 71 37.4N	DAY 04	DATA USE 1	BAROMETR 1013.1	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 152 08.5W	HOUR 11.8	AREA 10	CLOUD T/A 3/6	CL/TR	WEATHER X1	ORIG WBS 064	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.97	27.69	22.02	00.000	1456.9	07.54						
11.8	OBS	00000	03.97	27.692	22.02		1456.9	07.54	0.08		0.00	00.0	002.	
11.8	OBS	00005	03.95	27.691	22.02		1456.9	07.58	0.10		0.02	00.0	003.	
	STD	00010	04.22	27.86	22.13	00.058	1458.4	07.56						
11.8	OBS	00010	04.22	27.864	22.13		1458.4	07.56	0.08		0.09	00.0	001.	
11.8	OBS	00015	05.59	29.478	23.27		1466.4	07.08	0.13		0.18	00.0	006.	
	STD	00020	06.41	30.04	23.61	00.108	1470.5	06.93						
11.8	OBS	00020	06.41	30.036	23.61		1470.5	06.93	0.12		0.00	00.0	004.	
	STD	00030	06.28	30.36	23.89	00.149	1470.6	06.95						
11.8	OBS	00030	06.28	30.365	23.89		1470.6	06.95	0.18		0.05	00.2	005.	
11.8	OBS	00040	06.24	30.951	24.35		1471.4	06.97	0.21		0.10	00.6	003.	
	STD	00050	05.11	31.25	24.72	00.222	1467.3	07.24						
11.8	OBS	00050	05.11	27.52 P	21.780*			07.24	0.24		0.09	00.8	004.	
	STD	00075	03.50	31.77	25.29	00.296	1461.6	07.51						
11.8	OBS	00075	03.50	31.766	25.29		1461.6	07.51	0.40		0.19	04.2	009.	
	STD	00100	01.59	31.95	25.58	00.360	1453.9	08.10						
11.8	OBS	00100	01.59	31.951	25.58		1453.9	08.10	0.48		0.11	04.3	013.	
	STD	00125	01.26	32.17	25.78	00.418	1453.1	08.10						
11.8	OBS	00125	01.26	32.173	25.78		1453.1	08.10	0.56		0.23	03.8	012.	
	STD	00150	00.30	32.34	25.97	00.471	1449.4	08.21						
11.8	OBS	00150	00.30	32.336	25.97		1449.4	08.21	0.64		0.12	01.1	019.	
	STD	00200	- 1.37	32.79	26.40	00.563	1443.1	07.32						
11.8	OBS	00200	- 1.37	32.791	26.40		1443.1	07.32	1.10		0.12	06.0	039.	
	STD	00250	- 0.71	32.91	26.47	00.642	1447.2	07.01						
	STD	00300	- 0.23	33.27	26.74	00.714	1450.8	06.72						
11.8	OBS	00300	- 0.23	33.269	26.74		1450.8	06.72	0.94		0.19	12.3	025.	
	STD	00400	00.20	34.71	27.88	00.790	1456.4	06.18						
11.8	OBS	00400	00.20	34.708	27.88		1456.4	06.18	0.78		0.00	13.0	008.	
	STD	00500	00.20	34.80	27.95	00.810	1458.2	06.24						
11.8	OBS	00500	00.20	34.800	27.95		1458.2	06.24	0.76		0.09	14.2	007.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BOTDP 00247	AIR TEMP	04.4	DIR HGT PER		WIND-DIR 07	INST NANSEN CAST	TEN SQ 1617
CONSEC	0105	MONTH 09	SHIP GL	WET BULB	03.9	10 3 2		WIND-SPD 16	TRACE DIR	5 SQUARE 1
LAT	71 26.9N	DAY 04	DATA USE 1	BAROMETR	1009.9	SEA		WIND-FOR	DURATION	2 SQUARE 02
LONG	152 08.4W	HOUR 21.7	AREA 10	CLOUD T/A	3/6	CL/TR		WEATHER X1	ORIG W8S 065	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	04.68	27.56	21.85	00.000	1459.8	07.36						
21.7	O8S	00000	04.68	27.558	21.85		1459.8	07.36	0.00		0.00	00.0	002.	
21.7	O8S	00005	04.63	27.562	21.85		1459.7	07.41	0.00		0.00	00.0	000.	
	STD	00010	04.98	27.65	21.89	00.060	1461.3	07.67						
21.7	O8S	00010	04.98	27.652	21.89		1461.3	07.67	0.12		0.02	00.1	004.	
21.7	O8S	00015	06.44	29.828	23.45		1470.3	06.98	0.12		0.00	00.0	009.	
	STD	00020	06.08	30.69	24.17	00.108	1470.0	07.23						
21.7	O8S	00020	06.08	30.690	24.17		1470.0	07.23	0.00		0.00	00.0	000.	
	STD	00030	03.44	31.34	24.95	00.142	1460.0	07.68						
21.7	O8S	00035	02.57	31.580	25.22		1456.7	07.84	0.17		0.00	00.0	014.	
21.7	O8S	00045	01.71	31.898	25.53		1453.5	08.03	0.02		0.00	01.9	003.	
	STD	00050	01.50	31.91	25.56	00.196	1452.6	08.07						
21.7	O8S	00055	01.29	31.935	25.59		1451.8	08.11	0.29		0.00	01.7	010.	
	STD	00075	00.26	32.12	25.79	00.254	1447.7	08.43						
21.7	O8S	00085	- 0.13	32.211	25.89		1446.2	08.48	0.40		0.00	02.5	009.	
	STD	00100	- 0.50	32.34	26.01	00.307	1444.9	08.48						
21.7	O8S	00110	- 0.75	32.451	26.10		1444.1	08.30	0.50		0.00	02.6	015.	
	STD	00125	- 1.21	32.61	26.24	00.354	1442.4	07.63						
21.7	O8S	00135	- 1.36	32.782	26.39		1442.1	07.26	1.62		0.00	08.0	019.	
	STD	00150	- 1.26	33.25	26.76	00.393	1443.5	06.83						
21.7	O8S	00165	- 1.10	33.654	27.09		1445.1	06.50	1.04		0.00	10.3	035.	
	STD	00200	- 0.51	34.38	27.65	00.436	1449.4	06.08						
21.7	O8S	00220	- 0.04	34.658	27.85		1452.3	06.07	0.96		0.00	10.4	027.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BOTDP 00090	AIR TEMP	01.8	DIR HGT PER		WIND-DIR 09	INST NANSEN CAST	TEN SQ 1617
CONSEC	0106	MONTH 09	SHIP GL	WET BULB	01.6	05 2 2		WIND-SPD 10	TRACE DIR	5 SQUARE 1
LAT	71 22.5N	DAY 05	DATA USE 1	BAROMETR	1007.9	SEA		WIND-FOR	DURATION	2 SQUARE 02
LONG	152 13.0W	HOUR 02.6	AREA 10	CLOUD T/A	7/2	CL/TR		WEATHER X1	ORIG W8S 066	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	02.71	25.15	20.09	00.000	1448.1	07.99						
02.6	O8S	00000	02.71	25.148	20.09		1448.1	07.99	0.23		0.23	00.2	006.	
02.6	O8S	00005	05.32	27.993	22.13		1463.1	07.38	0.17		0.28	00.3	015.	
	STD	00010	06.04	29.85	23.51	00.060	1468.6	06.99						
02.6	O8S	00010	06.04	29.855	23.51		1468.6	06.99	0.24		0.13	00.1	018.	
02.6	O8S	00015	05.99	30.041	23.67		1468.7	07.03	0.25		0.00	00.0	010.	
	STD	00020	06.37	30.31	23.83	00.103	1470.7	06.88						
02.6	O8S	00020	06.37	30.310	23.83		1470.7	06.88	0.27		0.15	00.2	010.	
	STD	00030	06.22	30.67	24.13	00.142	1470.7	06.97						
02.6	O8S	00030	06.22	30.669	24.13		1470.7	06.97	0.29		0.06	00.1	008.	
02.6	O8S	00040	04.15	31.384	24.92		1463.3	07.48	0.39		0.24	00.5	006.	
	STD	00050	02.50	31.65	25.28	00.207	1456.7	08.54						
02.6	O8S	00050	02.50	31.655	25.28		1456.7	08.54	0.47		0.06	01.4	008.	
	STD	00075	00.79	32.14	25.79	00.268	1450.2	08.13						
02.6	O8S	00075	00.79	32.143	25.79		1450.2	08.13	0.68		0.15	01.4	014.	
02.6	O8S	00085	- 0.21	32.331	25.99		1446.0	08.20	0.82		0.23	02.3	012.	

N O D C S T A T I O N D A T A

REFID	31 8328	YEAR 1972	BOTDP 00049	AIR TEMP	01.8	DIR HGT PER		WIND-DIR 09	INST NANSEN CAST	TEN SQ 1617
CONSEC	0107	MONTH 09	SHIP GL	WET BULB	01.6	08 1 2		WIND-SPD 10	TRACE DIR	5 SQUARE 1
LAT	71 16.1N	DAY 05	DATA USE 1	BAROMETR	1007.5	SEA		WIND-FOR	DURATION	2 SQUARE 02
LONG	152 13.0W	HOUR 08.1	AREA 10	CLOUD T/A	4/2	CL/TR		WEATHER X1	ORIG W8S 067	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	02.90	26.01	20.76	00.000	1450.0	07.83						
08.1	O8S	00000	02.90	26.010	20.76		1450.0	07.83	0.00		0.38	01.4	008.	
08.1	O8S	00005	05.75	29.014	22.89		1466.2	07.20	0.08		0.26	01.2	012.	
	STD	00010	06.53	29.67	23.31	00.058	1470.4	06.84						
08.1	O8S	00010	06.53	29.668	23.31		1470.4	06.84	0.11		0.15	00.8	012.	
08.1	O8S	00015	06.44	29.944	23.54		1470.4	06.81	0.15		0.22	01.1	015.	
	STD	00020	04.20	30.02	23.84	00.101	1461.3	07.78						
08.1	O8S	00020	04.20	30.022	23.84		1461.3	07.78	0.21		0.13	00.8	012.	
	STD	00030	04.51	30.87	24.48	00.139	1464.0	07.65						
08.1	O8S	00030	04.51	30.870	24.48		1464.0	07.65	0.27		0.20	01.1	013.	
08.1	O8S	00040	03.15	30.918	24.64		1458.4	07.79	0.39		0.11	11.7	021.	
08.1	O8S	00045	02.80	31.305	24.98		1457.5	07.83	0.51		0.19	01.2	024.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00025	AIR TEMP 01.7	DIR HGT PER	WIND-DIR 14	INST NANSEN CAST	TEN SQ 1617
CONSEC 0108	MONTH 09	SHIP GL	WET BULB 01.5	09 2 4	WIND-SPD 02	TRACE DIR	5 SQUARE 1
LAT 71 05.5N	DAY 05	DATA USE 1	BAROMETR 1009.0	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 152 00.0W	HOUR 14.7	AREA 10	CLOUD T/A 3/3	CL/TR	WEATHER X1	ORIG WBS 068	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	01.00	24.46	19.62	00.000	1439.4	08.28						
14.7	OBS	00000	01.00	24.463	19.62		1439.4	08.28	0.10		0.15	00.4	000.	
14.7	OBS	00005	01.79	25.655	20.54		1444.7	08.08	0.08		0.45	01.2	000.	
	STO	00010	03.70	29.58	23.54	00.062	1458.5	07.92						
14.7	OBS	00010	03.70	29.581	23.54		1458.5	07.92	0.20		0.12	00.1	019.	
14.7	OBS	00015	04.58	29.919	23.72		1462.7	07.47	0.28		0.22	00.4	007.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00016	AIR TEMP 02.2	DIR HGT PER	WIND-DIR 04	INST NANSEN CAST	TEN SQ 1617
CONSEC 0109	MONTH 09	SHIP GL	WET BULB 01.9	09 1 3	WIND-SPD 02	TRACE DIR	5 SQUARE 1
LAT 71 08.0N	DAY 05	DATA USE 1	BAROMETR 1009.4	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 152 06.0W	HOUR 17.7	AREA 10	CLOUD T/A 3/6	CL/TR	WEATHER X1	ORIG WBS 069	1 SQUARE 12

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	01.27	24.15	19.37	00.000	1440.2	08.14						
17.7	OBS	00000	01.27	24.155	19.37		1440.2		0.27		0.29	00.6	011.	
17.7	OBS	00005	01.81	24.874	19.92		1443.7	08.14	0.30		0.41	00.8	013.	
	STO	00010	03.96	29.65	23.57	00.063	1459.7	07.83						
17.7	OBS	00010	03.96	29.649	23.57		1459.7	07.83	0.48		0.09	00.3	013.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00018	AIR TEMP 02.5	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1617
CONSEC 0110	MONTH 09	SHIP GL	WET BULB 02.5	05 1 4	WIND-SPD 05	TRACE DIR	5 SQUARE 1
LAT 71 10.3N	DAY 06	DATA USE 1	BAROMETR 1011.4	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 153 50.0W	HOUR 05.6	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X4	ORIG WBS 070	1 SQUARE 13

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	03.99	26.42	21.01	00.000	1455.3	07.83						
05.6	OBS	00000	03.99	26.419	21.01		1455.3	07.83	0.04		0.27	00.8	010.	
05.6	OBS	00005	05.51	28.698	22.66		1464.8	07.31	0.06		0.41	01.3	009.	
	STO	00010	05.70	29.31	23.13	00.058	1466.5	07.25						
05.6	OBS	00010	05.70	29.311	23.13		1466.5	07.25	0.12		0.14	00.4	009.	
05.6	OBS	00015	05.62	29.530	23.31		1466.5	07.11	0.12		0.11	00.3	008.	

N O D C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTOP 00029	AIR TEMP 02.2	DIR HGT PER	WIND-DIR 03	INST NANSEN CAST	TEN SQ 1617
CONSEC 0111	MONTH 09	SHIP GL	WET BULB 02.2	05 2 4	WIND-SPD 02	TRACE DIR	5 SQUARE 1
LAT 71 13 N	DAY 06	DATA USE 1	BAROMETR 1012.1	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 153 36 W	HOUR 08.9	AREA 10	CLOUD T/A 6/7	CL/TR	WEATHER X4	ORIG WBS 071	1 SQUARE 13

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNDPTH	SND VEL	DXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STO	00000	03.42	26.12	20.82	00.000	1452.5	07.84						
08.9	OBS	00000	03.42	26.124	20.82		1452.5	07.84	0.08		0.02	00.0	002.	
08.9	OBS	00005	05.65	28.652	22.61		1465.4	07.24	0.14		0.00	00.0	005.	
	STO	00010	05.94	29.27	23.06	00.059	1467.4	07.31						
08.9	OBS	00010	05.94	29.268	23.06		1467.4	07.31	0.16		0.09	00.2	004.	
08.9	OBS	00015	04.99	29.634	23.46		1464.1	07.38	0.23		0.12	00.3	002.	
	STO	00020	03.91	30.86	24.53	00.100	1461.2	07.47						
08.9	OBS	00020	03.91	30.865	24.53		1461.2	07.47	0.62		0.09	00.4	009.	

N O O C S T A T I O N D A T A

REFID 31 8328	YEAR 1972	BOTDP 00048	AIR TEMP 06.4	DIP HGT PER	WIND-DIR 10	INST NANSEN CAST	TEN SQ 1617
CONSEC 0112	MONTH 09	SHIP GL	WET BULB 04.8	09 2 3	WIND-SPD 10	TRACE DIR	5 SQUARE I
LAT 71 19.5N	DAY 06	DATA USE 1	BAROMETR 1014.5	SEA	WIND-FOR	DURATION	2 SQUARE 02
LONG 153 32.0W	HOUR 13.4	AREA 10	CLOUD T/A 6/6	CL/TR	WEATHER X1	ORIG WBS 072	1 SQUARE 13

CASTNUM/TIME	LVLTYP	DEPTH	TEMP	SAL	SIGMA-T	DYNOPTH	SND VEL	OXYG	PO4	TOT P	NO2	NO3	SIO3	PH
	STD	00000	03.82	27.18	21.62	00.000	1455.6	07.72						
13.4	OBS	00000	03.82	27.177	21.62		1455.6	07.72	0.15		0.06	00.2	003.	
13.4	OBS	00005	03.96	27.406	21.79		1456.6	07.63	0.16		0.00	00.0	008.	
	STD	00010	04.40	27.76	22.03	00.060	1459.0	07.54						
13.4	OBS	00010	04.40	27.762	22.03		1459.0	07.54	0.13		0.02	00.1	003.	
13.4	OBS	00015	05.28	29.522	23.34		1465.1	07.45	0.16		0.06	00.2	006.	
	STD	00020	05.22	30.04	23.75	00.110	1465.7	07.40						
13.4	OBS	00020	05.22	30.041	23.75		1465.7	07.40	0.24		0.00	00.1	010.	
	STD	00030	05.46	31.03	24.51	00.148	1468.1	07.02						
13.4	OBS	00030	05.46	31.034	24.51		1468.1	07.02	0.29		0.04	00.3	000.	
13.4	OBS	00040	03.83	31.033	24.68		1461.5	07.29	0.66		0.01	00.7	011.	

WEBSEC Projects of Opportunity

By

GARY L. HUFFORD[1]

INTRODUCTION

The U.S. Coast Guard Oceanographic Unit has been coordinating a summer and early autumn multidisciplinary marine ecological baseline investigation (WEBSEC) of the coastal waters adjacent to the Alaskan North Slope since 1970. Some of the shortcomings of the cruises was: (1) lack of other seasonal data; and (2) determination of the source of a warm water advection in the western Beaufort Sea. Opportunity arose to conduct short programs from the USCGC GLACIER in 1971 and the USCGC STATEN ISLAND in 1972 to help solve some of the shortcomings of WEBSEC.

An expendable bathythermograph (XBT) program was conducted aboard the CGC GLACIER from the Bering Strait to Point Barrow, Alaska to trace Bering Sea water to the western geographical boundary of the Beaufort Sea. It was hoped that the data might substantiate the hypothesis that the warm water mass observed in the western Beaufort Sea is in fact Bering Sea water. This report contains the results of these XBT sections taken in mid-August and in mid-September, 1971.

Oceanographic stations of opportunity were taken along the North Slope from the CGC STATEN ISLAND during early July, 1972. This report contains the physical and chemical data collected on this cruise and a preliminary discussion of the results.

EASTERN CHUKCHI SEA

In the summer near the North American continent, the coastal waters of the eastern Chukchi Sea are characterized by a warm (>2°C), low salinity (<31‰) water that has flowed north from the Bering Sea. This water has been classified Alaskan Coastal Water (ACW) by Saur et al. (1954). It is known to occupy the entire water column near the continent. The low salinity of the water mass reflects the large freshwater discharge of the Alaskan Rivers into the Bering Sea. As one proceeds away from the coast to the west, the depth of the ACW becomes less than 25 meters. Below the warm layer an intermediate water mass is found and is characterized by temperatures of more than 2°C and salinities of 30.6 to 32.2‰. Origin of this water mass is also the Bering Sea. In the central portions of the eastern Chukchi Sea, the surface waters are influenced by warm Bering Sea water and by local heating (Aagaard, 1964). Below the surface layer a relatively cold (<1°C), and saline (>32.6‰) water of Bering Sea origin occupies the water column to near the bottom. Farther north near Herald Shoal (70°20′N) the presence of icemelt determines the surface water characteristics, while the subsurface layer is still of Bering Sea origin.

Classification of water masses during the winter in the eastern Chukchi Sea is lacking. Practically all data taken in the Chukchi Sea have been obtained in the summer. Comprehensive work in the winter is required for a complete understanding of the area.

Freezing in the winter and melting in the summer creates distinct water masses in the eastern Chukchi Sea and the shallowness of the sea make wind and tidal energy particularly effective in mixing water masses. Also the large surface area of the sea increases the influence of the exchange of heat in the waters. For these reasons there has been a tendency to subdivide the waters of the

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area using many vague definitions and names for the water masses resulting in some confusion in the literature. Classification of any water mass may be valid only in a particular area and for that particular season.

The average flow of water through the Bering Strait into the Chukchi Sea is about 1×10^6 m^3 sec^{-1} (Coachman, 1968). This water flows northward tending to follow the Alaskan coast and dominates the circulation pattern in the eastern Chukchi Sea. LaFond and Pritchard (1952) were able to trace Bering Sea water in the summer into Kotzebue Sound where it then headed around Cape Lisburne toward Point Barrow. The cruise of the BROWN BEAR in the summer of 1959 (Fleming, 1959) conducted an extensive investigation of currents in the eastern Chukchi Sea. Speeds up to 150 cm/sec were reported north of Point Hope Alaska. Weak anticyclonic eddies were found northeast of the major Alaskan capes.

There have been no extensive programs of current measurements in the eastern Chukchi Sea in the fall or winter months. Coachman and Tripp (1970) have reported on current measurements made through the ice in an area approximately 140 nm southwest of Cape Lisburne. Their results indicated a northward flow, the same as in the summer.

METHODS

Two XBT sections were taken from the CGC GLACIER on 12-15 August and 18-20 September 1971 (figs. 1 and 2). The XBT drops were calibrated with bucket thermometer readings. The first section in August (13 lowerings) was run from Bering Strait to Point Barrow, Alaska. The second section in September (43 lowerings), was taken in the opposite direction.

The CGC STATEN ISLAND operated from Bering Strait to northeast of Prudhoe Bay in the Beaufort Sea from 1-17 July 1972. A total of 23 hydrographic stations and 34 XBT lowerings were taken in water depths rarely exceeding 60 meters (fig. 3). At each station, a Nansen bottle cast was taken to obtain measurements of temperature, salinity, dissolved oxygen and inorganic nutrients (PO_4, NO_3, NO_2, SiO_3). Observations were obtained at 5 meter intervals from the surface to near bottom on each cast. XBT lowerings were taken every 3 hours from Bering Strait to Point Barrow, Alaska, then every 30 miles from Point Barrow to Prudhoe Bay. A detailed discussion of sampling methods can be found in the previous article of this book (Physical Oceanography of the Western Beaufort Sea).

RESULTS

CGC GLACIER XBT Sections

Examination of temperature from the XBT section taken from just east of St. Matthew Island in the Bering Sea to Point Franklin, Alaska in the Chukchi Sea, 12-15 August 1971, showed that Bering Sea water could be traced as far north as Point Franklin (fig. 4). The 6°C isotherm outlines the lower boundary of Alaskan Coastal Water (ACW) of Saur et al. (1954) and can be easily traced northward. It is interesting to note that the temperature range of the warm water mass in the Beaufort Sea in August, 1971 was 0.1 to 5°C (see preceding article).

Examination of the XBT section over essentially the same course track in 18-20 September 1971 indicated that Bering Sea water could be traced north only to Cape Lisburne, Alaska (fig. 5). This suggests that if the warm water mass in the Beaufort Sea is Bering Sea water then input to the warm water mass (>0°C) ceases by mid-September as would be expected with the onset of autumn.

CGC STATEN ISLAND Cruise

The temperature and salinity values observed from the Bering Strait to Point Barrow July, 1972 (fig. 6) corresponded with water mass properties defined by Saur et al. (1954) for the area except that slightly cooler temperatures were recorded. The surface water from Bering Strait to station 8 (fig. 3) appeared to be Alaskan Coastal Water (ACW). This water mass occupied only the upper 10 meters of the water column instead of the entire depth as seen later in the summer. Temperatures varied from 0.1 to 5.9°C and salinities ranged from 29.0 to 31.4‰. North of station 8, surface temperatures were generally less than

0°C, reflecting the presence of or nearness to sea ice cover. It should be noted that ACW may have been found farther north than station 8. The oceanographic stations occupied in the eastern Chukchi Sea were very shallow (<20 m) and close to the continent so that the mass of ACW may not have been observed. This is indicated by a temperature maximum (2.23°) observed at 20 meters at station 14 east of Point Barrow, Alaska (fig. 7). The presence of this warm, relatively saline (31.8°/oo) water at station 14 probably indicates the advection of Bering Sea water from the Bering Sea into the Beaufort Sea. The presence of a slight temperature maximum (0.32°C, 32.01°/oo) at station 15 (see appendix) probably indicates the eastward extent of the advection for this time of year. It was the location of the warm layer at station 14 and 15 that influenced the position of the moored current meters used during WEBSEC-72 later in the season. A detailed discussion of Bering Sea water can be found in the previous article in this book (Physical Oceanography of the Western Beaufort Sea).

In the eastern Chukchi Sea those temperatures of less than −1.0°C with salinities greater than 32.0°/oo probably represent Bering Sea Deep Shelf Water (BSDSW) of Saur et al. (1954). This water mass is believed to be formed in the winter and is not normally found north of the Bering Strait after July.

The near-bottom water found at station 9 (fig. 8) in the eastern Chukchi Sea may have come from the East Siberian Sea instead of the Bering Strait. Codispoti and Richards (1968) found that East Siberian Sea Water (ESSW) had a temperature and salinity range of −1.6 to −1.8°C and 32.3 to 33.4°/oo. The water from 15 m to the bottom (40 m) at station 9 was nearly isothermal (−1.57 to −1.62°C) and isohaline (32.90 to 32.95°/oo). It was 0.5°C colder and slightly less saline than BSDSW observed farther south. The water was also lower in dissolved oxygen (<7.9 ml/l) then surrounding waters.

Surface temperature and salinity values observed east of Point Barrow in the Beaufort Sea reflect the onset of icemelt and river runoff. Temperatures were generally at or near 0°C with salinities varying from 4.9 to 26.7°/oo (fig. 6). A subsurface temperature minimum layer (−1.4 to −1.6°C) of about 5 meters thick was observed at many of the Beaufort Sea stations at 10 meters depth. The cold water sandwiched between warmer waters forms a dicothermal layer (Defant, 1961). This layer is due to the limitation of the winter convection process by the high stability of the water column. This suggests that the depth of winter convection in the southern Beaufort Sea for 1971-72 was in general less than 15 meters.

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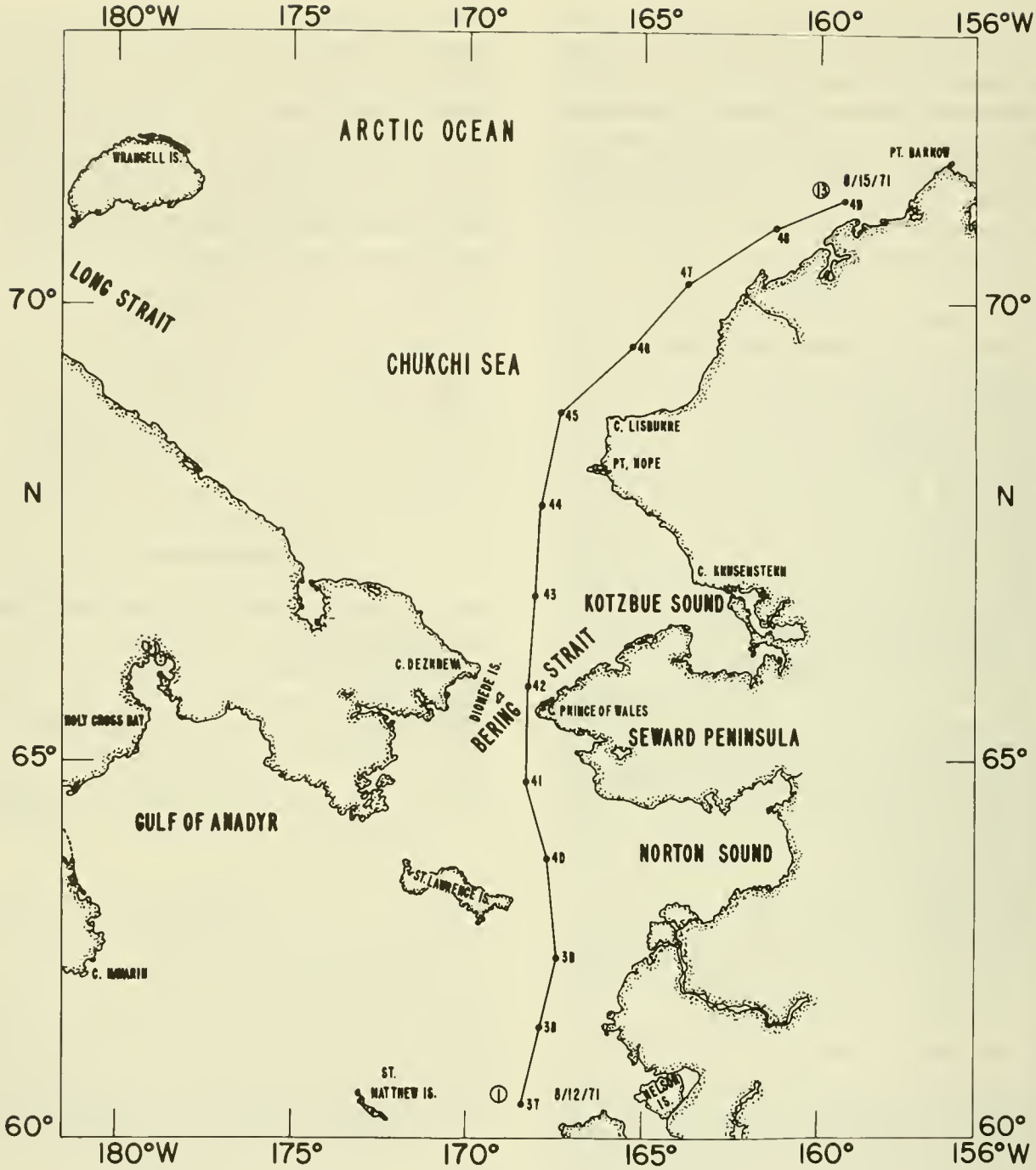

Figure 1.–Location of XBT Section taken from CGC GLACIER, 12-15 August 1971.

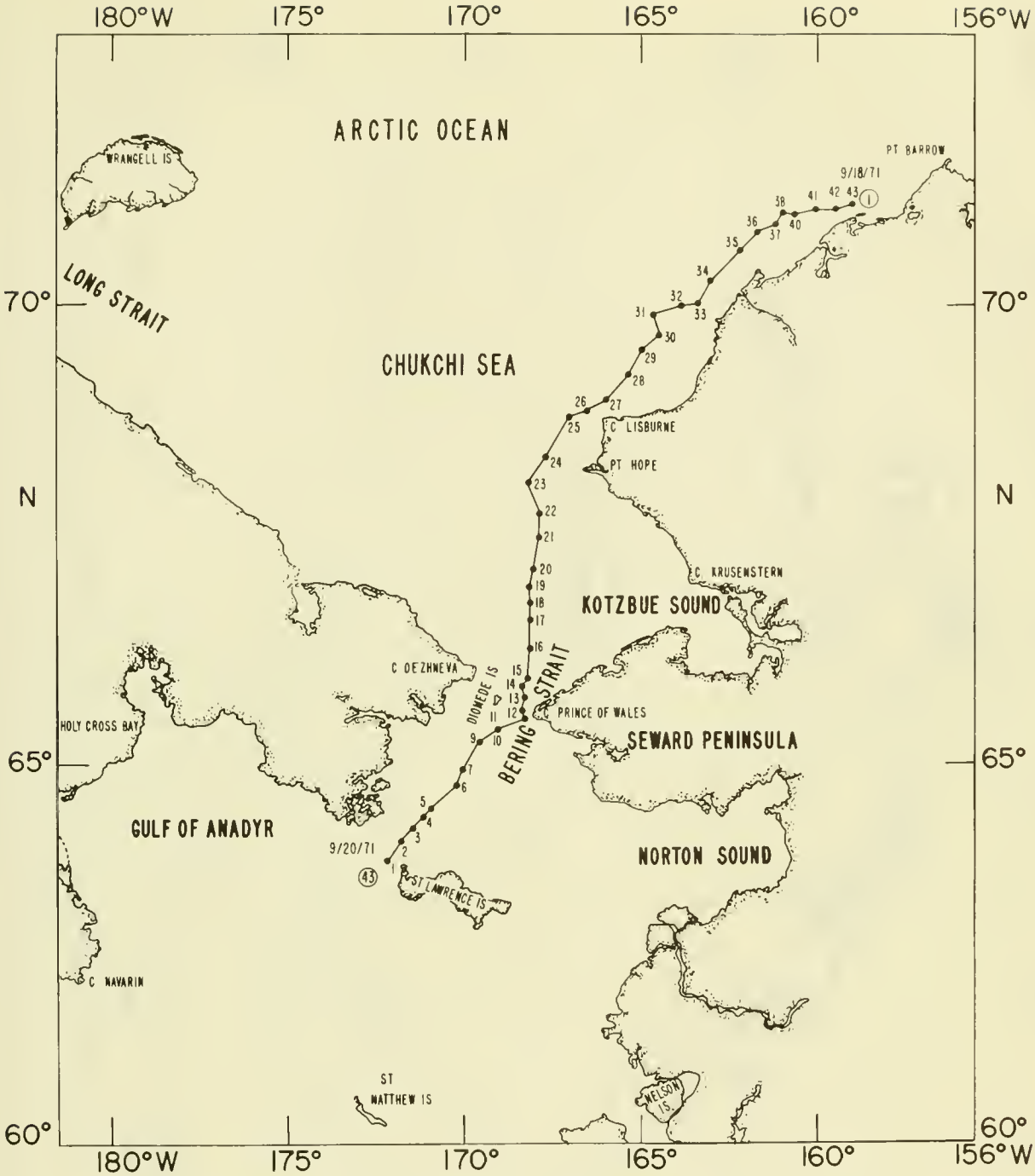

Figure 2.–Location of XBT Section taken from CGC GLACIER, 18-20 September 1971.

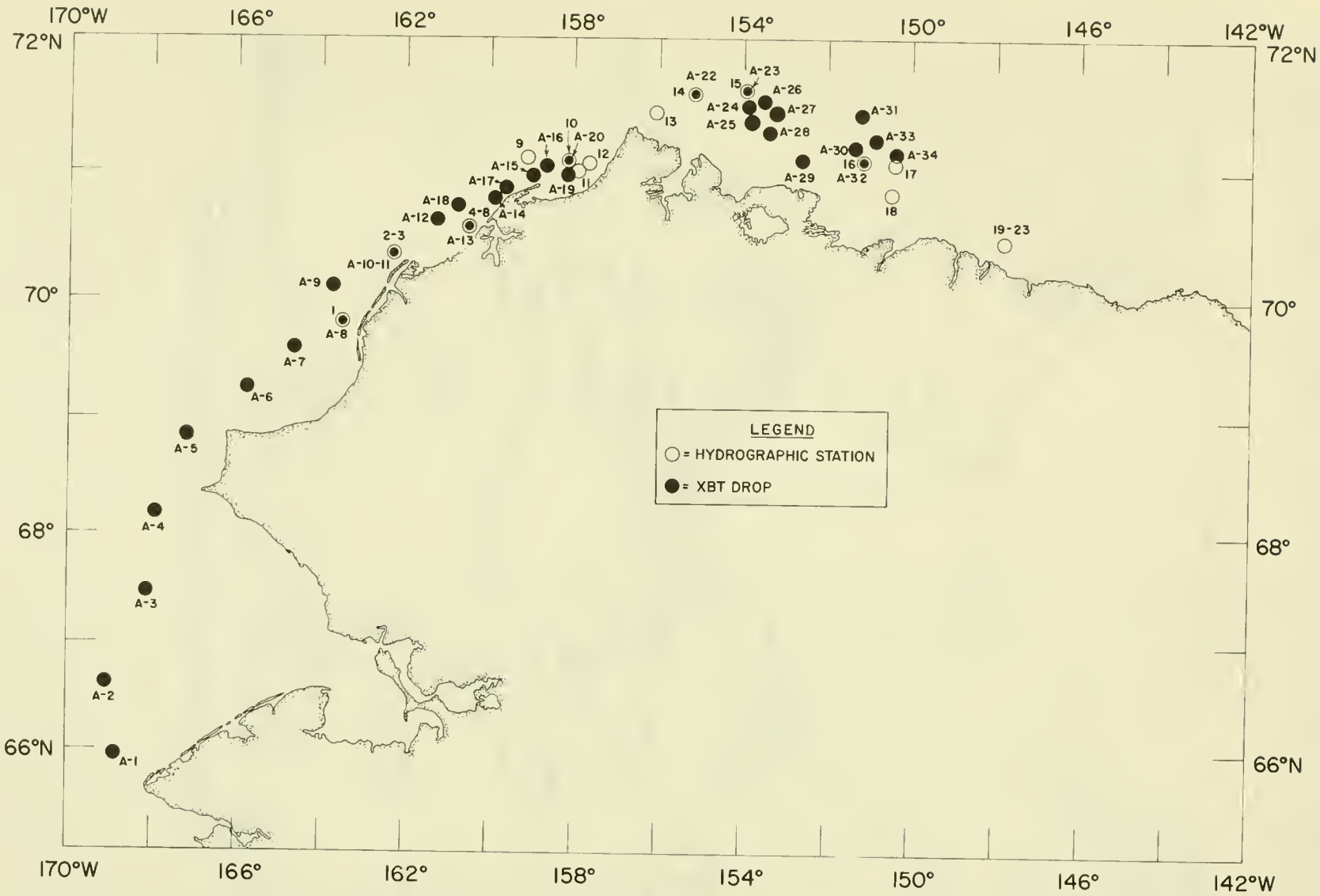

Figure 3.–Location of hydrographic stations and XBT Lowerings, STATEN ISLAND cruise, 1-17 July 1972.

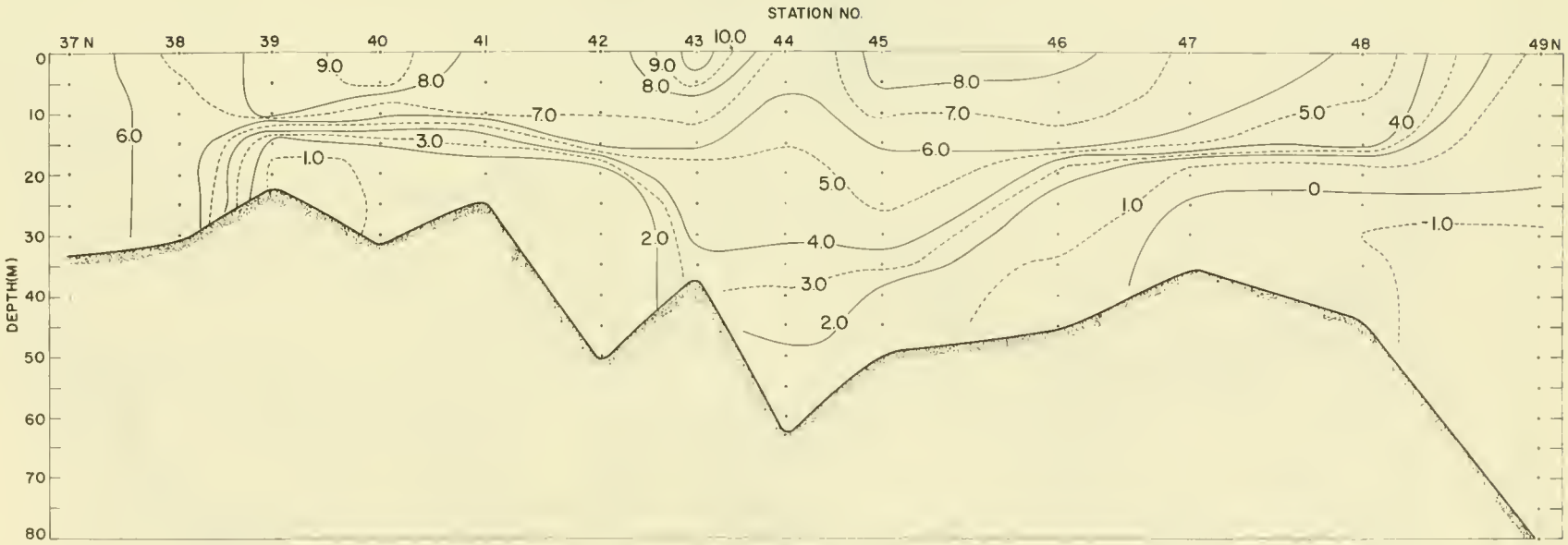

Figure 4.–XBT Section taken from CGC GLACIER, 12-15 August 1971.

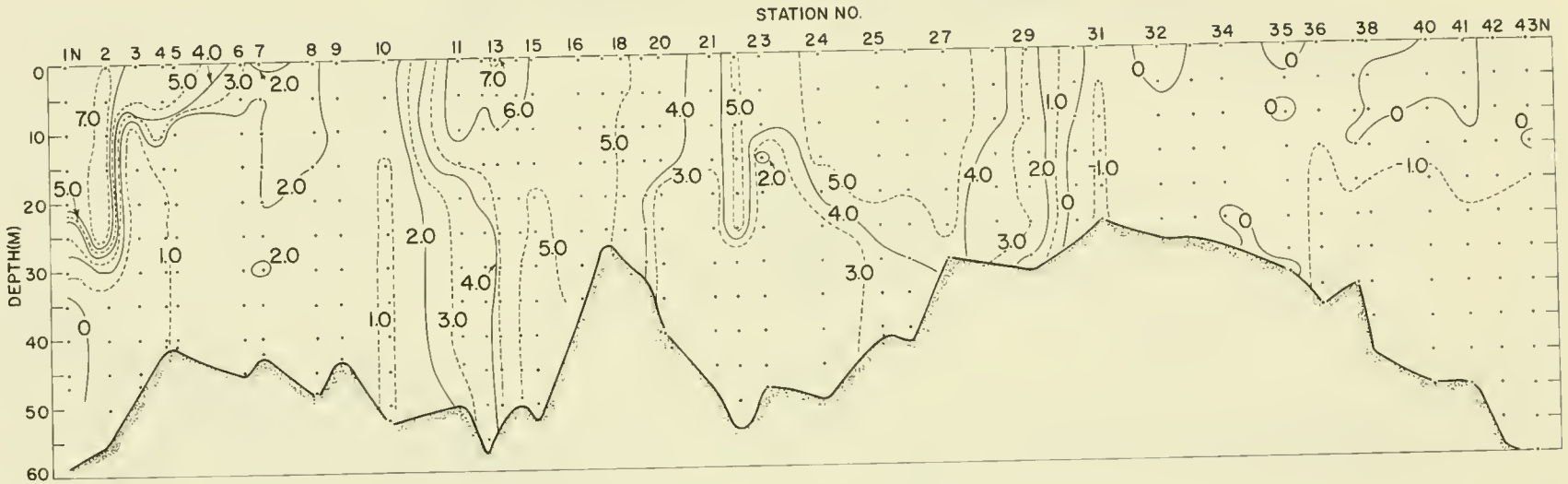

Figure 5.–XBT Section taken from CGC GLACIER, 18-20 September 1971.

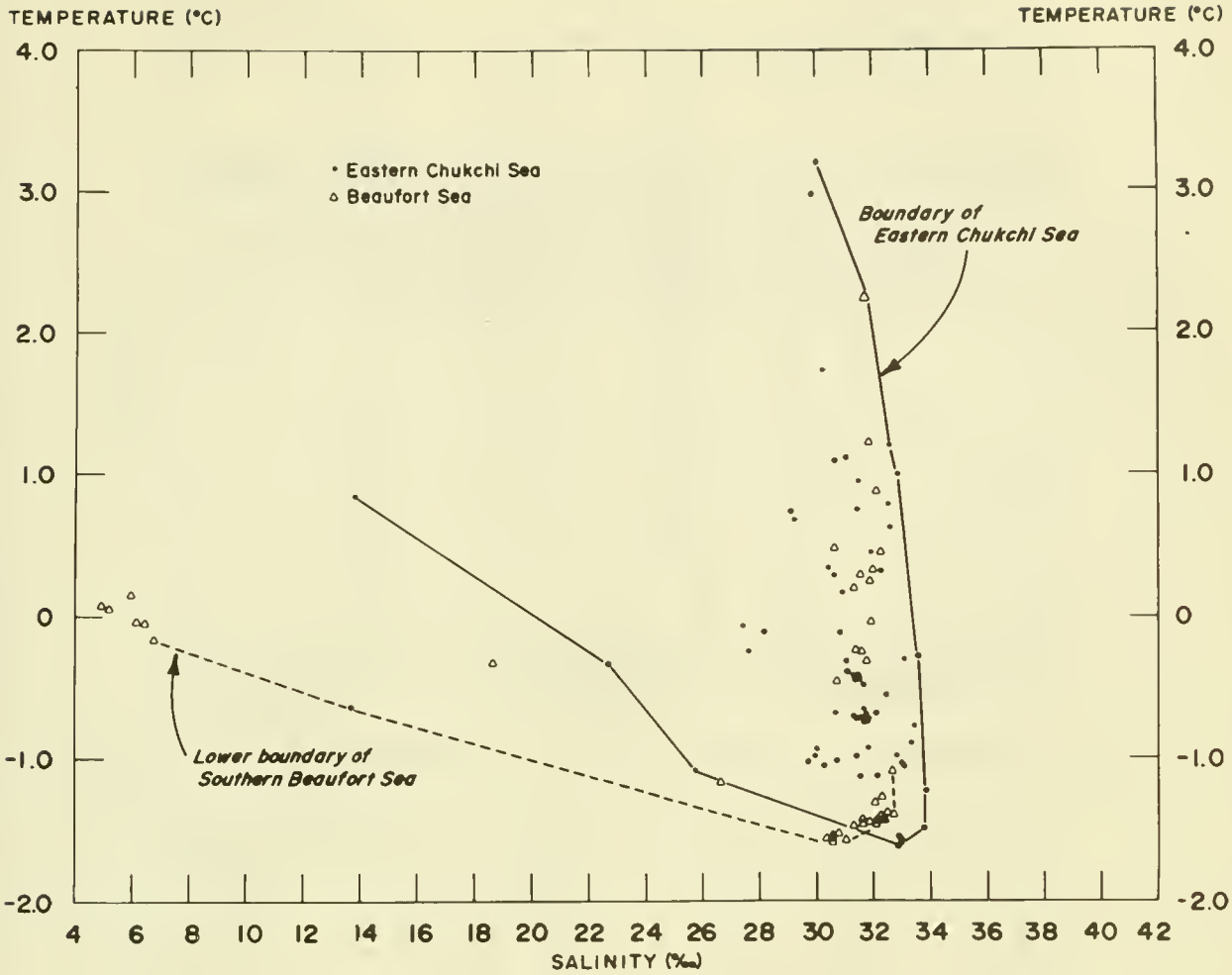

Figure 6.–Temperature (°C)—salinity (°/oo) values observed from Bering Strait to Beaufort Sea during STATEN ISLAND cruise, 1-17 July 1972.

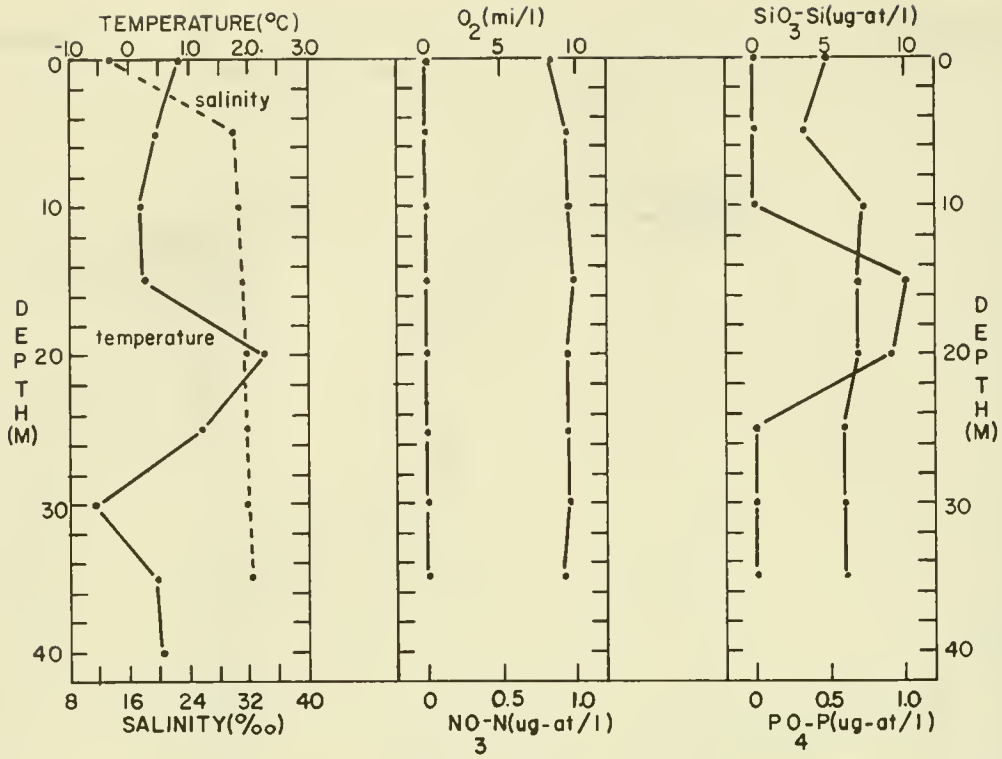

Figure 7.–Distribution of observed properties at station 14 during STATEN ISLAND cruise, 1-17 July 1972.

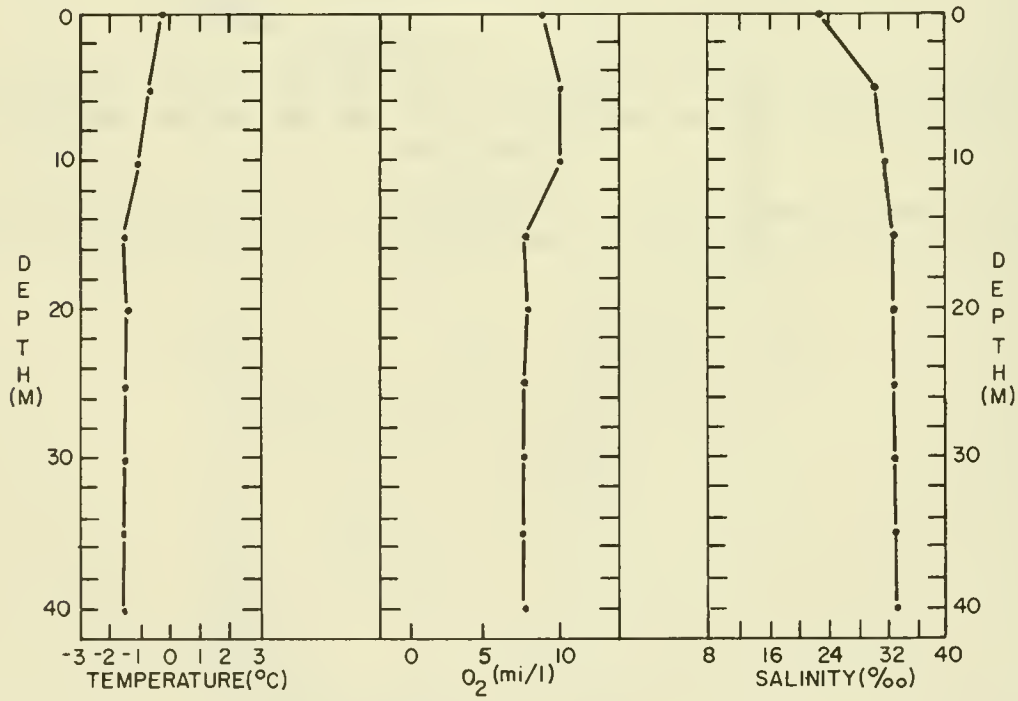

Figure 8.–Distribution of temperature, salinity and dissolved oxygen at station 9 during STATEN ISLAND cruise, 1-17 July 1972.

PRELIMINARY RESULTS OF MARINE GEOLOGIC STUDIES OFF THE NORTHERN COAST OF ALASKA

By

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Preliminary Results of Marine Geologic Studies off the Northern Coast of Alaska

By Peter W. Barnes

Abstract

During the past three years of Arctic shelf studies the U.S. Geological Survey endeavored to outline the geologic processes unique to this environment and to obtain a suite of background data. The Arctic shelf of Alaska slopes gradually from the coast out 50-75 km to a shelf break at 60 to 80 meters of water depth. A small number of 2-10 m high ridges occur near the coast and along the shelf break. Contemporary ice gouging is the most significant microrelief feature on the shelf, occurring at all water depths.

A complex pattern of turbidity and particulate transport is developed over the shelf. Surface values of suspended particulate matter range from 0.5 to 2 mg/l over the central shelf. Values systematically increase near river effluents. A more vigorous shelf circulation during the 1972 season is reflected in a doubling of particulate matter values and an increase in turbidity over the 1971 season. Vertical turbidity profiles delineate three water types: a) surficial melt water, b) coastal water, and c) oceanic water. Near-bottom water generally is more turbid owing to waves, bioturbation, or ice gouging.

Sediments of the central shelf are mostly fine-grained silts with ice-rafted pebbles. Towards the shelf break they coarsen to gravelly muds. Inshore, cleaner sand and gravels are associated with the barrier island and ridge complex, while the lagoons are flooded with sandy muds. Cores of the upper 50 cm of sediment indicate a midshelf region of homogeneous mud interspersed with pebbles probably resulting from ice gouge mixing. Inshore, sediment layering is commonly present, suggesting more rapid sedimentation and/or less ice mixing. Along the shelf break and upper slope, bioturbation is common along with a relict or residual surface gravel.

Background values of lead, copper, zinc, arsenic, mercury and cadmium are low compared to lower latitude shelves. The organic fraction is derived primarily from plant detritus.

INTRODUCTION

General

This report presents the data collected in the course of an environmental baseline study off the northern coast of Alaska. Part of the investigation is focused on studying the present-day geologic processes. Three goals were taken under consideration: 1) To obtain a usable quantity of geologic data in a little known environment, 2) to interrelate oceanographic, biological, and chemical variables with geologic processes, and 3) to examine the stability of the present-day marine geologic regime. At present only a small segment of the data has been digested; this report will examine the conclusions that can be reached.

The area studied extends from Cape Simpson on the west to Barter Island on the east and from the northern coast of Alaska out to the base of the continental slope (fig. 1). The Continental Shelf in this area is essentially an extension of the broad low coastal plain of Pleistocene and Holocene silts, sands, and gravel (Payne and others, 1951). The shelf break is remarkably shallow, occurring at only 70 meters (Carsola, 1954).

The marine geology of the region is poorly known. Carsola (1954) reviewed earlier work and presented the majority of information on the marine sediments known until the present study. More recently, the clay mineralogy has been considered by Naidu and others (1971), and the role of ice as a geologic agent on the shelf has been investigated by Kovacs (1972), Reimnitz and others (1972a), and Pelletier and Shearer (1972). Preliminary work on the recent geologic history and sediment thicknesses in the near-shore area was published by Reimnitz and others (1972b). These studies have indicated a gently sloping shelf with little topographic expression outside of the extensive microrelief caused by drift ice interacting with the bottom.

Methods

Three vessels were used to gather information. During August and September of 1971 and 1972 fieldwork was accomplished from the U.S. Coast Guard icebreaker GLACIER and from the 38-foot research vessel NATCHICK of the Naval Arctic Research Laboratory. The U.S. Geological Survey's 40-foot research vessel LOON gathered information during August and September of 1971 and from July into September of 1972. The location and type of geologic data from these efforts are outlined in a report by Barnes and others (1973).

Most of the techniques used in collecting and storing the samples have been outlined in Barnes and others (1973). Coring devices used include box corer, Hydroplastic corer, and a Ewing-type piston corer with a 40-foot barrel and plastic liner. (See Bouma, 1969, for a complete discussion of these sampling devices.)

Textural analysis of the sediments involved standard techniques. Grain size of the gravel fraction was determined by sieve analysis. The sand-sized material was processed in a 2-meter Woods Hole type settling tube (Schlee, 1966) calibrated to sieves. Silt and clay fractions were analyzed by the hydrometer method. Computer analysis of size data was used to calculate component ratios, Folk and Ward statistics (Folk and Ward, 1957), Trask statistics, and standard moment measures. Box cores were examined and radiographed using techniques outlined by Bouma (1969).

Suspended fine-grained sediment transport was studied using turbidity measurements from a transmissometer. These were supplemented by Secchi disc readings. In addition, surficial water samples of 1 to 4 liters were obtained and filtered on preweighed filters for particulate matter. During 1971, 0.45 μ silver filters were used with only moderate success owing to partial solution of silver in sea water and an attendant loss in filter weight . This error was corrected for by determining the loss in weight after back-flushing with filtered demineralized water and microscopic examination of both the back-flushed filter and the flushed filtrate for the efficiency of the flushing. It is believed that the values obtained in this manner are accurate within 0.2 mg/1 and are comparable to the data gathered during the following year (1972). After testing several types of filters it was found that 0.8 μ membrane filters gave the most consistent results (Bradley Larsen, 1972, written communication); these were used during the 1972 field studies. During both the 1971 and 1972 seasons the sea-water samples were carefully collected to avoid any contamination by the research vessel. A standard volume (usually 4 liters) was

then measured before pressure and vacuum filtration. The filters were then carefully rinsed with filtered distilled water to remove all traces of salt. All filter weighings were done using a five-place analytical balance.

RESULTS

Suspended Particulate Matter

In 1971 inshore surface waters of the Beaufort Sea had concentrations of suspended matter which averaged 1.0 mg/l and ranged from 0.1 mg/l to 4.2 mg/l, while in 1972, values averaged 2.8 mg/l and ranged from 0.5 mg/l to 31.0 mg/l. (See figs. 2 & 3, Appendix A.) The most obvious difference between 1971 and 1972 concentration of particulate matter is the two-fold increase from one year to the next. Offshore, in water depths greater than 20 meters, suspended sediment concentrations for 1971 averaged .5 mg/l, but in 1972 the concentrations averaged 1.2 mg/l.

The distributional patterns of suspended particulate matter (figs. 2 & 3) show that the higher, 1972 values were not localized in any one area. As a result the distribution pattern is similar, but the absolute values are higher in 1972. For example, central and outer shelf waters northwest of the Canning River generally have higher suspended particulate values in both years. The data off of Barter Island indicated an offshore displacement of contours in both 1971 and 1972 data, perhaps due to the influence of MacKenzie River water.

However, in 1972 the gradients around river mouths are much more pronounced than in the previous year. Concentrations in the surface waters of Harrison Bay off the Colville River were greater than 30 mg/l at one station in the western part of the bay.

Turbidity

The average turbidity of surficial Beaufort Sea waters as measured by Secchi disc shows very clear water (20 m) in the seaward parts of the study area beyond the shelf (figs. 4 & 5 and Appendix A). Secchi readings also confirm that shelf waters were more turbid in 1972 than in 1971. For example, the 10 m Secchi visibility contour was displaced 30-40 km farther seaward in August 1972 than in August 1971 (figs. 4 & 5). The 15-m contour shows much less displacement. This suggests that most of the turbid water is confined to the continental shelf.

Turbidity, measured as transmissivity or attenuation of light over a .1- or 1-m path, presents a more complex picture, partly because light attenuation is measured by the transmissometer at many points in the water column. The Secchi disc is different in that it integrates attenuation factors over the path from the observer's eye to the disc.

In 1971, a four-part attenuation profile was recognized that peristed more or less throughout the summer. A surface layer of moderately clear water up to 5 meters thick (layer A, fig. 6) was underlain by a turbid layer 5-10 m thick (layer B, fig. 6). These two layers are believed to represent ice melt and river runoff, respectively. In areas where ice was rarely found, the surface layer was absent or poorly developed. Layer B was most pronounced and turbid inshore, often appearing as the surface layer in absence of layer A. The entire four-part profile was best developed on the inner shelf in areas where the ice front was not too distant from shore.

Below these two layers was generally clear water that extended to within about 15 m of the bottom on the shelf and to at least 65 m (the maximum depth of measurement) in deeper water (layer C, fig. 6). This water is believed to represent Arctic Surface Water (Hufford, this volume).

The bottom 10 to 15 m of the transmissity profile usually showed an increase in turbidity toward the sea floor (layer D, fig. 6). A bottom turbid layer of this type is a common feature on other continental shelves (Rodolfo and others, 1971; Swift and others, 1973). Wave activity is often thought to be the agent responsible for resuspension of bottom sediments into the near bottom turbid layer. This is not a likely mechanism in this environment due to the ice cover which severely curtails the wave activity on the shelf. Important exceptions may be the occasional open season storm such as those observed in 1970 (Sept. 13-16, MacKenzie delta region) and 1972 (Hufford, this volume). Thus a large part of this bottom layer could be due to biological activity and to bottom gouging by moving ice (Reimnitz and others, 1972a).

Summary of Particulate Transport

Values of turbidity and suspended matter are a result of both organic and inorganic detritus in the water. Unfortunately this study lacks a determination of the ratio between organic matter and inorganic mineral detritus.

Observations during the summer of 1971 and 1972 indicate a remarkable difference in particulate matter and turbidity from one year to the next. Concentrations of particulate matter in 1972 were about double those of the previous year. In addition, turbidity values show clearer surface water in 1971, compared to 1972 values, especially over the shelf. The lower concentrations of ice found during 1972 and the resultant increase in wave activity (Hufford, this volume) would suggest that much of the increase in particulate suspension and transport results from increased wave activity on the inner shelf. Indeed, it was observed that coastal and lagoonal waters were much more turbid than shelf waters during late July when the ice cover was still quite extensive; however, by the latter part of August, aerial observations showed turbid waters (often the most turbid) occurring on the shelf outside the lagoons. This suggests wave resuspension of nearshore sediments seaward of the lagoons was an important mechanism during 1972.

The lower ice concentrations found over the shelf in 1972 also influenced turbidity by decreasing the contribution of relatively clean ice melt water. Yet to be evaluated is the variance in river runoff, which might result in a change in sediment contribution as this is known to vary considerably from year to year (U.S. Geological Survey, unpub. data).

Meager current and oceanographic data for this sea suggest a weak westward drift (Coachman, 1968; Naval Hydrographic Office, 1958). However, studies along the Alaskan Coast show the currents to be more complex; local currents are closely related to wind stresses and are locally strong in both east and west directions (Kinney and others, 1972; Shore, 1973). A further complication is the intrusion of relatively warm Bering Sea water along the shelf break. This is discussed more fully by Hufford in this volume.

Short-term observations of bottom currents in 1971 (table 1), show considerable variance in speed and direction. Thus at present it is problematical to determine the dominant transport direction for suspended and resuspended particulate matter. It is nonetheless intriguing to speculate on the cross shelf region of increased particulate matter and turbidity (figs. 2, 3, 4 & 5) as an area of convergence and seaward transport of suspended matter. It is in this region that the bottom currents show a net northward transport of water (Sta. 23, table 1). This is also the area where Hufford (this volume) reports that the "westward"-moving Beaufort Gyre generally meets the "eastward"-moving Bering Sea water. Hufford also reports consistently higher concentrations of sea ice in this same general region (ibid.). If this area is a zone of suspensate concentration it is not reflected in the underlying sediments, which will be shown to be gravel muds coarser than elsewhere on the shelf (see discussion of bottom sediments).

Table 1.—Net current (including tidal components) determined from progressive vector summation. (See fig. 1 for location)

Sta #	Depth (meters)	Period of record (hours)	Speed (knots)	Direction of current (True)
23	27	26	.06	045
67	20	10	.11	315
90	24	11	.20	090
94	28	12	.05	110

Note: As the period of record is nearly 1 or 2 full tidal cycles, the influence of tidal currents is minimal.

Naidu and Sharma (1972) also studied suspended particulate matter during the same 1971 cruise on which our data were gathered, and they used similar techniques. Their data indicate a markedly different distribution of particulate matter. They are generally higher and do not show the seaward decrease in concentration of suspended matter that we report here but do indicate a region of extremely high values (up to 11 mg/l) along the shelf break north of Prudhoe Bay. Elsewhere their values of surface suspensates are only slightly higher than ours. In view of the high water clarity found along the shelf break (see figs. 2 & 4), it is

difficult to explain the region of very high suspended sediment concentration along the shelf break reported by Naidu and Sharma. In studying particulate concentration at depth, they note a lack of systematic vertical differences. A comparison of these data with individual transmissometer records and the stations where the data were gathered shows no correlation.

As a result of this differing distribution, Naidu and Sharma's conclusions regarding the movement of particulate matter are unique. They call for an eastward transport of sediment-laden coastal ice or river effluent from the Colville and Kuparuk Rivers to explain the region of high values (Naidu and Sharma, 1972, p. 6). This is inconsistent with the fact that: 1) most, if not all of the coastal ice would have melted by the time of their study (August) and thus would be an insignificant contributor of sediments, 2) the ice present in the spring off rivers contains negligible amounts of sediments (Reimnitz and Bruder, 1972; Barnes and Reimnitz, 1972), and 3) the bulk of river sediment is discharged during breakup in June (Arnborge and others, 1967), 2 months earlier than Naidu and Sharma's study. In any event, considering their data and the data of this report, a complete definition of the fine-grained transport regime is lacking.

Values of surface particulate concentration and turbidity for the Beaufort Sea (figs. 2-5 and Appendix A) are similar to values from lower latitude shelves (Drake and others, 1972; and Manheim and others, 1970). Surface values of particulate matter decreased rapidly away from the coast to concentrations less than 1 mg/l for the outer shelf and open sea. Two points regarding the comparison of lower latitude studies with those of this report remain uncertain: 1) whether or not the 9-month ice cover, or its development and attrition, seriously influences the distribution; and 2) whether the concentration of organic versus inorganic constituents is similar to that at lower latitudes.

Bottom Sediments

The surface deposits of the arctic shelf of Alaska are a heterogeneous mixture of sediments which exhibit a strong influence of ice. The presence of a thick ice cover during more than half the year makes sampling difficult, and interpretation of conditions during the period of ice cover is no doubt important, but, at present somewhat speculative. Field observations have been limited from the end of July into early September, when icebreaker operation is feasible. We are aided in our interpretation of year-round conditions by the "memory" of past events recorded in sediment cores.

The statistical grain-size parameters of surface sediments presented in Appendix A attest to the heterogenous nature of the sediments. The variability is greater along the nearshore zone and at the shelf break, as seen in the contorted contours of mean grain size and sediment sorting (figs. 7, 8, 9). At the shelf break, bimodal gravel-muds are present which are characterized by poor sorting (4-6 phi) and unrealistic sand size mean daimeters (50-300 μ). Modal analysis of these samples shows primary modes in the coarse sand and fine silt size materials, while the means fall in between. The wide variety of sediments present in this shelf is illustrated in the span of points shown in the scatter plot of mean diameter vs. sorting (fig. 10). However, it is possible to recognize three groupings. Using these divisions, three environments or sediment types can be distinguished (figs. 10 & 11): a) a poorly sorted, generally coarser sediment found along the shelf break and on the central shelf off Prudhoe Bay, b) a fairly well sorted, sand-and silt-size sediment characteristic of the inshore areas, and c) moderate to well-sorted fine-grained sediment of the central shelf and continental slope. One end member designated by the solid triangles on figure 9 is a fairly well sorted (possible aeolian) silt-clay that was collected from ice flows (fig. 10).

In the densly sampled nearshore area between Oliktok Point and the Sagavanirktok River, the sediment pattern is very complex. This suggests that the distribution of sediment types in this area may be patchy. Here many sand samples are found with excellent sorting (less than 1 phi unit standard deviation), although some poorly sorted gravelly muds have been found north of Cross and Reindeer Islands, and a gravel and boulder "patch" is present on the lagoon floor northeast of the Sagavanirktok River (fig. 7 & 8). Areas of

pre-Holocene (?) stiff silty clay have also been found.

Two other generalities can be deduced from the mean diameter and sorting diagrams. First, there is an east-west change in sediments that occurs north of Cross Island. Sediments on the shelf to the east are generally more coarse than those to the west (fig. 7, 8). The eastward coarsening is most pronounced on the outer and central shelf. Secondly, northeast of Cross Island a band of coarser sediments including gravels extends across the shelf (figs. 7, 8, & 9).

Radiographs of shelf sediments from 18-140 m show three distinct types of sedimentary facies. Inshore (at 15-20 m water depth), the cores are characterized by laminated sands and clays (fig. 12). On the central part of the shelf, between 20 and 50 to 70 m of water depth, muds intersperse with sand and gravel. These sediments exhibit virtually no structures, and little bioturbation can be seen in the samples (fig. 13), which characteristically resemble thoroughly mixed chocolate chip cookie batter.

Along the shelf break from 50-140 m a sequence exists capped by a bioturbated, muddy gravel averaging 5-20 cm in thickness and often containing abundant fauna. This gravel layer tends to become more pronounced toward the eastern part of the study area. Underlying the gravel and mud is a silty mud often showing fine, faint laminations. Pebbles and bioturbation are uncommon in this zone.

Sediments from the base of the continental slope show numerous poorly developed laminations in a matrix of fine muds (fig. 15). There appears to be a complete absence of sand and gravel material in this core, although a grab sample at this same station (Sta. 19b, Appendix A) recovered coarse sands.

Heavy-Mineral Studies

Heavy-mineral concentrates have been obtained from sand-size fractions (2.0-0.062 mm) of 129 samples, using tetrabromoethane (S. G. = 2.96) as the separation medium. The heavy-mineral concentrate ranged from 0.1 to 4.3 percent of the samples' original dry weight. The concentrations of heavy minerals in the sediments reveal crude trends, parallel to the shelf break. Percentage values appear to be consistently below 1% within 40 km of the coast. The highest percentages (2-3%) appear in a linear trend along the slope break.

Grain mounts were made of the very-fine-sand fraction (0.125 - 0.062 mm) using Lakeside 70 as a mounting medium on glass slides. Where there was insufficient material, fine sand (0.250 - .125 mm) was also included. In a point-count, 300 grains are counted (150 in a N-S sweep and 150 in an E-W sweep). Counting is complicated by the moderate to severe staining and diversity of the mineral suite.

Based in a cursory examination of the samples and a selected count of a few slides, the entire sampled area has been divided into regions. Most of the heavy mineral grains examined are opaque minerals, rock fragments, and mineral aggregates. Minerals of the ortho-and clinopyroxene and epidote groups rank second in abundance. Other minerals counted are garnet, tourmaline, apatite, zircon, sphene, rutile, monazite, hornblende, and chloritoid. The large variety of unstable minerals attests to the immaturity of the sediments and suggests little reworking by water.

There appears to be a significant variation in the distribution of only one mineral: garnet. Off Point Barrow, garnet comprises 10 percent of the mineral suite. North of Cape Halkett, the percentage decreases to 6, and near Barter Island, the percentage is about 1. More grain mounts must be examined before this distribution can be definitely confirmed.

Geochemical Studies

The organic content of 13 sediment samples from 11 locations averaged 1.5 percent of the dry sediment weight (Appendix B). The alkaline-solution part of the organic matter is dominantly of the humic type (from plants) and averaged about 0.2% of the total sediment weight. The bitumen or petroleum-like fraction constitutes an average of less than 0.0004% of the sediment dry weight—much lower than bitumen values found at lower latitudes (Vernon Swanson, written commun., 1972). These results suggest: 1) very low background values of a petroleum-like substance in the sediments, and 2) the contribution of terrestrial organic fraction (humus) masks the

Table 2.—Trace element concentrations of selected surface samples, 1971

Size fraction	Number of samples	Average (ppb)	Range (ppb)
Mercury			
Clay	21	34.7	10-150
Silt	94	45.9	10-250
Sand	43	35.1	10-120
Gravel	12	20.0	10-50
Total	170	40.0	10-250
Arsenic		(ppm)	(ppm)
Clay	21	22.8	9-60
Silt	94	20.0	8-30
Sand	43	16.2	8-30
Gravel	12	14.3	6-20
Total	170	19.0	6-60
Lead			
Clay	21	14.0	10-20
Silt	94	14.4	5-20
Sand	43	9.8	4-20
Gravel	12	7.0	3-24
Total	170	12.4	3-24
Zinc			
Clay	21	133.4	100-180
Silt	94	95.2	44-140
Sand	43	59.2	20-95
Gravel	12	43.4	25-68
Total	170	87.3	20-180
Copper			
Clay	21	28.6	25-40
Silt	94	21.1	10-40
Sand	43	12.0	5-25
Gravel	12	11.7	5-25
Total	170	19.1	5-40

production of marine organic matter (bitumen) (Vernon Swanson, written commun.)

Average concentrations of several heavy metals (table 2 and Appendix A) are close to those found in oceanic sediments elsewhere (Wedepohl, 1969) and just slightly higher than those in the eastern Chukchi Sea (Barnes and Leong, 1971; Barnes, 1972). Consequently, the values reported here would appear to be background concentrations for these elements in the region studied.

Preliminary examination of the data suggests that the concentrations are related to sediment textures with higher values in finer grained sediments. However, the lack of baseline studies at this time continues to make for a formidable problem of integrating source, transport mechanism, and depositional regime at this stage of our knowledge.

DISCUSSION

Sedimentary Processes

Carsola (1954) describes the northern shelf of Alaska as one of coarser and more poorly sorted sediments, compared with the shelf to the east, off the Mackenzie River, and to the west, in the northern Chukchi Sea. In these two areas, fine sediments are derived from the Mackenzie River and the Bering Sea, respectively. The absence of these sources for the Alaskan Beaufort shelf left a (relict?) coarser sediment. Carsola found the dominant sediment to be a coarser silt, except for finer materials off the Colville River. He believed ice-rafting to be an important influence on the textural parameters of the sediment.

Naidu (1973 and this volume) notes an apparent lack of gravel in the marine deltaic and lagoonal sediments. He ascribes this dearth to one of three possibilities: 1) lack of transport by ice or currents, 2) dilution of gravel input by sand, silt and clay deposition, and 3) insufficient sample size. Our observations show that gravel is not transported by ice or currents (Barnes and Reimnitz, 1972). It is most probable that the inshore area is a depositional area for sands and mud. In contrast to the delta fronts and lagoons, Naidu finds, as does this report, that the sediments further offshore contain a larger proportion of gravel. He reviews: (a) the lack of evidence for present-day transport, (b) the lack of a coarse to fine sediment gradation offshore across the shelf, and (c) the absence of modern hydrodynamic conditions to transport gravel, and concludes that

these are relict, ice-rafted deposits. Each of Naidu's conclusions is examined below.

Naidu's conclusion seems to be in part correct, although his arguments need support. There are few modern reports of gravel on sea ice in the Beaufort Sea (Kindle, 1924; Carsola, 1954; Lafond, 1949; R. Lewellen, oral communication). The plausibility of ice-rafting as a modern transport mechanism requires an estimate of how much gravel would have to be in the ice canopy at any one time to account for the present accumulation on the shelf. On the basis of observations during WEBSEC 1971-73 of (1) the number of gravel patches observed (there was a total of 3), (2) estimates of the average amount in each occurrence (5 metric tons), (3) the area observed, (4) the rate of pack movement, and (5) the cover over the shelf, I estimate an accumulation rate of 5 $mg/cm^2/10^3yr$.

This would amount to 85 mg of gravel per cm^2 in the 5-10 meters of Holocene sediment which is found on the shelf (Reimnitz and others, 1972b and unpublished data). The amount of gravel seen on the shelf is conservatively estimated to be 20,000 mg per cm^2 in the Holocene section (2% gravel in 5 m of sediment). This calculation suggests an accumulation rather more than 2 orders of magnitude higher than can be accounted for by my ice observations. If ice is rafting gravel at the same rate today as throughout the Holocene, there should be at least 100 times as much gravel as I actually observed. I conclude that modern ice-rafting of gravel is insignificant.

An "inverse" sediment grading with coarser (more gravel) sediments offshore would be expected if ice-rafting were an active agent. During any melt season (the time when gravel is most likely released from floating ice) on the average more ice would be present on the outer shelf than on the inner shelf (U.S. Navy Hydrographic Office, 1958). Therefore the number of potential gravel release points would be higher on the outer shelf, and greater abundance of ice-rafted gravel should be expected. Thus the lack of a coarse-to-fine sediment gradation as noted by Naidu (1973 and this volume) could be used as an argument in support of ice-rafting as an important mechanism of sediment transport. In contrast, my studies document ice-rafting as an important mechanism in shelf transport; however, as Naidu notes, the question often is not how, but when the rafting occurred.

Direction of Sediment Transport

The overall movement of ice and water in the Beaufort Sea gyre off the northern coast of Alaska is to the west (Campbell, 1965). On the inner shelf there are significant short-term shifts in the pattern of ice and water movement (table I). Here the current and ice movement during the open season are dominated by the wind regime, and both easterly and westerly currents up to 100 cm/sec are observed (Kinney and others, 1972; Short, 1973; and Hufford, this volume).

Studies on the inner shelf during the season of ice cover (Barnes and Reimnitz, 1972 and unpublished data) show an overall westward water movement at very low velocities (less than 2 cm/sec). This is probably due to the fact that the ice cover reduces wind stress as a water-movement mechanism.

The bulldozing effect of ice gouging appears also to be dominantly in a westward direction (Reimnitz and Barnes, 1972). As a result, sediments whether a) in suspension, b) resuspended by currents or ice gouging, c) carried by rafting, or d) bulldozed are, in toto, probably being transported westerly on the Alaskan shelf. The sediments reflect this westward transport in being finer grained and better sorted to the west along the shelf (fig. 7, 8, & 9). The westward gradation is emphasized by two factors. Firstly, the Alaskan shelf is essentially closed to major sediment input from the eastern end. Sediment load of the Mackenzie River does not reach the central Beaufort Sea; instead it appears to be transported eastward from the delta (Collin 1962; and unpublished ERTS-1 satellite photos). Secondly, the coast extends further from the foothills of the Brooks Range in a westward direction. The river sediments reflect this longer coastal plain traverse to the west by debouching finer and more mature sediments in a westward direction.

The eastward coarsening appears to end just east of Herschel Island on the western edge of the Mackenzie Canyon (Wagner, 1972). East of this region sedimentation appears to be dominated by the Mackenzie River.

Sedimentary Environments

Preliminary analyses suggest that the shelf sediments can be grouped into three types on the basis of the agent responsible for the sediment's primary character: 1) wave and current controlled, 2) ice-rafted and ice gouged, and 3) ice-rafted. The first type occurs inside the fast ice-pack ice boundary, which occurs between the 10 to 20 meter contour. Here the influence of drifting ice on the bottom is least felt, owing to the absence of ice movement during winter (Weeks and others, 1971). Here, also, the influence of waves and currents during the open season is most pronounced. It is also in this zone that ice-rafting is least effective as: (a) little or no ice moves in this zone during the winter, and (b) it is the zone most likely to be free of ice during the summer. It is in this zone that the better sorted and layered sandy sediments are developed under the influence of the open season waves and currents (fig. 12).

The second type occurs at mid-shelf depths and is characterized by unstructured, gravelly muds. The muds exclusive of the gravels are believed to be derived from local rivers, as their abundance, expressed as a decrease in overall sediment grain size, is greater off the western part of the study area. Such a gradation would exist assuming westerly transport and a system closed to the introduction of new sediments in the eastern end. However, the scatter plot of mean diameter and sorting (fig. 10) shows that the well-sorted fine-grained material collected from sea ice may be an end member source of the fine-grained sediment.

The lack of bedding structures in box cores from this area reflects intense gouging (Reimnitz and others, 1972a; Reimnitz and others, 1973). The repetitive scouring and plowing of the bottom by ice homogenizes the sediments and weakens or obliterates any structures which may have been previously developed. A core taken from the side of an ice gouge shows a pronounced slope to the sediment water interface and contains a non-horizontal block with layering relict of a previous episode of sedimentation (fig. 16). The absence of significant bioturbation suggests that these sediments are presently being reworked. Further offshore where gouging is apparently less intense or older bioturbation is better developed, bottom photographs of the central shelf show a patchiness of animal distribution which correlates with ice gouging. Areas with a well-developed fauna show little evidence of bottom disruption, and the microrelief is usually much subdued from additional sedimentation (fig. 17). Bottom photos of areas showing fresh breaks and scarps reveal only a sparse benthic fauna (fig. 18). Presumably the areas with abundant fauna have not been scoured by ice as recently as areas with fresh breaks and fewer animals.

The third sediment type occurs along the shelf edge, where ice-rafting appears to dominate the surficial sedimentary processes. While gouging is present (Reimnitz and Barnes, 1972), there is nothing to indicate positively whether or not the gouges are modern or relict features. As mentioned above there is much more evidence of bioturbation in this zone (fig. 13). This, coupled with the presence of horizontal layering, would suggest an older age for the ice-bottom interaction. Along the central and western shelf break only the surficial deposits are gravels. The underlying materials are laminated muds, strongly suggesting that the gravels have been rafted. From the Canning River eastward, box cores have not been able to penetrate through the gravels, presumably because they thicken in this direction.

Determining the transport mechanism for the shelf gravels presents problems. The lithologies, shapes, and surface striations indicate that the gravels are ice rafted from source areas in the Southern Canadian archipelago (Craig Rodeick, oral communication, 1973). Modern ice rafting is suggested by the occurrence of surface gravels at the shelf edge; however, we see no modern evidence for this rafting. The ferro-manganic coatings on some gravels (Naidu and Sharma, 1972) also suggest an older age for the gravels.

The eastward increase noted in the abundance of gravel indicates an eastward source; however, the gradient of increase is perhaps too steep for a source as distant as the Canadian islands. With such a distant source, the concentrations of gravel should be more equitable on the Alaskan shelf. Furthermore, gravels should occur on the slope. The most plausible explanation is that relict rafted gravels have been "diluted" by subsequent finer grained sedimentation. Toward the east

there is less dilution because the influx of fine grained materials is less; consequently gravel concentrations are higher. Toward the west the relict gravel should be at some depth below the present sea floor as suggested by diving observations (Reimnitz and others, 1972). Its presence in the surface sediments is due to reworking by ice gouging. The surficial gravel at the shelf edge is an enigma in this scheme.

At depths below the shelf break, finer sediments are found which are structurally characterized by bioturbation and faint horizontal lineations (fig. 15). The almost complete absence of gravel is perplexing. If sedimentation were diluting the gravel contribution from ice rafting, the biological activity as indicated by bioturbation should probably not be so well developed. Another possibility is a paucity of ice rafting, either now or in the past, beyond the shelf break. However, at present, there is no reason for believing that ice rafting halts or slows abruptly at the shelf break. It also might be argued that the deeper deposits are slumped sediments which are common on the slope (Arthur Grantz, oral communication, 1973). If this is the case the sediments might be representative of a period when no ice rafting occurred.

The above discussion indicates that our understanding of shelf sedimentology is far from complete. Materials are present that must have been ice rafted, judging from the dichotomy of sizes present and the angular shapes of some of the clasts. What is unclear is whether or not these result from contemporary processes or reflect agents operating some time in the past, perhaps during a lower stand of sealevel. Any interpretation will have to consider that this shelf experiences intensive ice-bottom interaction, and radiogenic dates from such an area must be interpreted with great care.

It follows that the absence of information on sedimentary structures and an incomplete knowledge of the year-round influence of ice in most other regions investigated make a comparison of the sedimentary environment of the Alaskan Beaufort shelf with other arctic shelves problematical. Creager and Sternberg (1972, p. 361), in an excellent review article on the problems of understanding continental shelf sedimentation, noted: "A lack of [measurements] of the environment in which the sediments exist. We can no longer interpret the environment from a vague knowledge of the nature and distribution of the sediments." Nevertheless, tentative comparisons can be made between textural parameters of several shelf areas.

It appears that the sediments found on the Alaskan Beaufort shelf are remarkably similar to those reported by the University of Washington group for the sediments off northern Siberia (Silverberg, 1972; Holmes, 1967; Naugler, 1967). Observations on this shelf are similar even to the point of noting the occurrence of a grey stiff silty clay, ascribed as pre-Holocene, which we also have found on the inner shelf (Sidoryenko, 1970). Silverberg notes puzzling mixtures of surficial fine silts and underlying sands which he ascribes to bioturbation, but which, if it occurred in our area of study, would most likely result from ice gouging.

A major difference between these two shelves is in their width: The Siberian shelf is 350-400 km wide, the Alaskan shelf 50-100 km. Presumably as a result of this, and the poor ice conditions, the Siberian outer shelf has only been sparsely sampled and reported on in the open literature. Thus a comparison of our coarsening of sediments along the shelf break is not possible. However, a comparison with the limited Canadian data would suggest that the sediments of the Mackenzie embayment coarsen along the shelf break as do the sediments of the Alaskan shelf (Wagner, 1972; Yorath and others, 1971).

CONCLUSIONS

The primary observation that has resulted from this study is that both ice and water significantly influence geologic processes and products. In contrast to temperate latitudes, where movement of water is the primary agent, along the northern coast of Alaska ice (gouging, rafting, as permafrost) and water trade off in time of year and geographic location as the most significant agent. The result is a complex environment which we are just beginning to understand. The following specific observations should be considered tentative:

1. Particulate transport varies markedly from year to year, depending on the vigor of the open season circulation, the occurrence of storms, and the extent of ice cover over the shelf. Overall values of particulate matter are similar to those found at lower latitudes.

2. Vertical turbidity layering seen over the shelf can be ascribed to a) river runoff, b) ice melt water, c) a bottom turbid layer, and d) Arctic ocean water.

3. The sediments reflect the influence of both water (waves, tides, and currents) and ice (gouging and rafting).

4. The shelf sediments can be broken into three basic types: 1) A laminated sand and mud interspersed with pebbles occurring on the inner shelf in the area where current reworking and ice action are both prevalent. 2) Ice-mixed pebbly mud occurring on the central shelf and in inshore areas where ice gouging homogenizes the sediments. 3) Muddy gravels, underlain by laminated muds found dominantly along the shelf edge. The gravels are tentatively ascribed to ice-rafting.

5. The importance of modern ice rafting of sand and gravel is still undetermined. Ice rafting of fine grained (aeolian?) materials appears to be a common mechanism and accounts for the majority of "dirty" ice observed over the shelf.

6. Arctic shelf sediments are not dominantly relict as previously reported in the general literature. However, contrary to some reports, river sediments are not being ice rafted to depositional sites in the Beaufort Sea.

7. Geochemical studies show essentially no anomalously high values of petroleum-like substances or of some of the more common toxic heavy metals.

ACKNOWLEDGMENTS

Erk Reimnitz has provided continual stimulating discussion and has served as co-worker. I wish to express my appreciation to my fellow scientists, and to the captain and crew of the GLACIER, without whose efforts this study could not have been conducted. The Naval Arctic Research Laboratory generously furnished the NATCHIK and her crew for our inshore studies. James V. A. Trumbull withstood the rigors of small-boat operations and collected most of the inshore samples. T. Forgatsch, C. Gustafson, P. Malin, R. Patrick and A. R. Tagg aided in the collection and reduction of data. Stimulating discussions were provided by E. Reimnitz and A. S. Naidu. Part of this work has been supported by a NASA contract S-70243AG to work with ERTS-1 imagery.

Tom G. Ging and Vernon E. Swanson performed the organic chemical analysis; Kam Leong determined the heavy metal contents; and Gretchen Luepke studied the mineralogy. Their assistance is appreciated. Robert Rowland and Paul Carlson critically read the manuscript and suggested many improvements.

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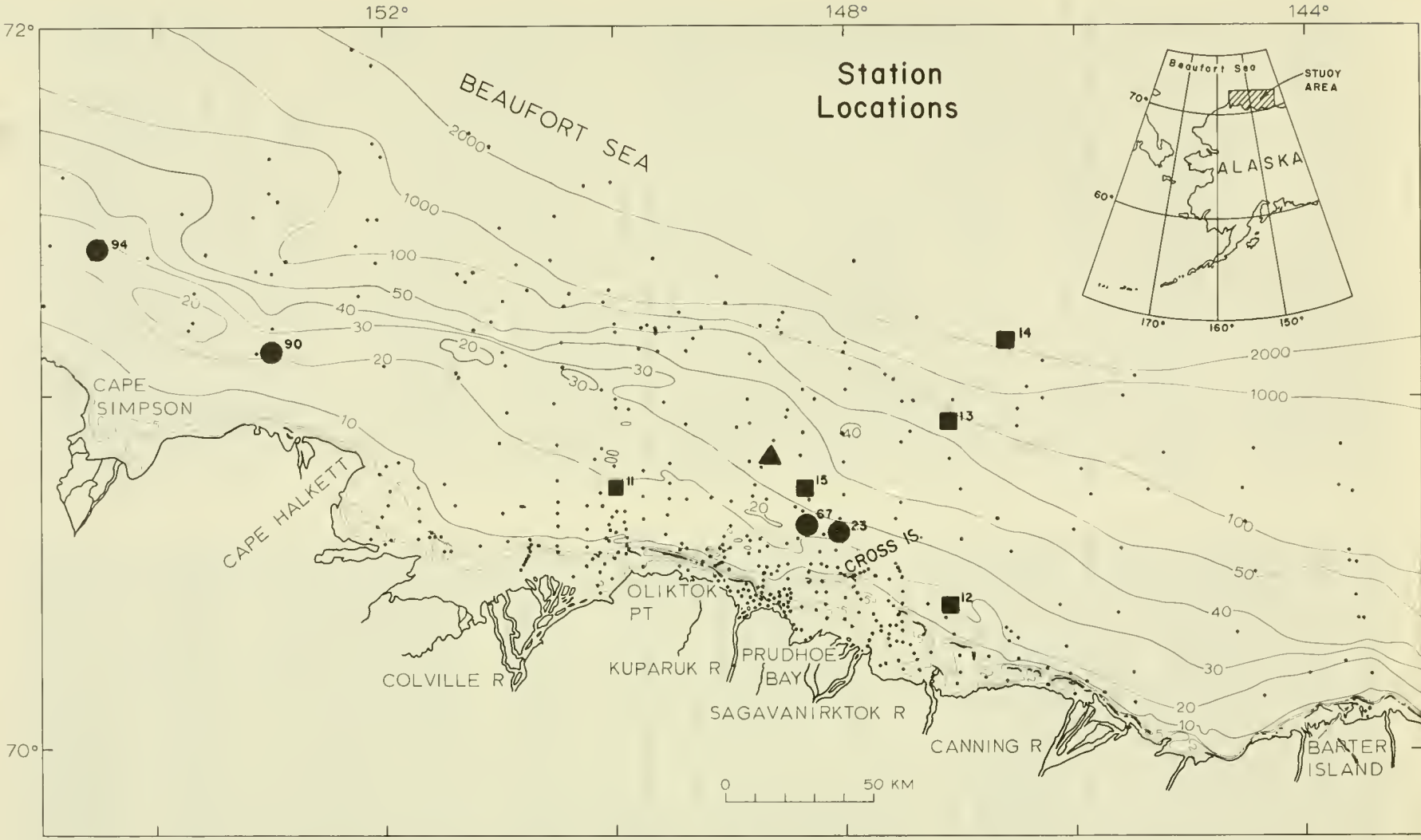

Figure 1.–Location of sampling stations occupied off the northern coast of Alaska during 1971-1973 and the general bathymetry (in meters). Bathymetry modified from National Ocean Survey chart 9403. See Barnes and other (1973) for a complete description of station information. The solid triangle locates the bottom photos of figures 17 and 18, the solid squares locate the box cores with their respective figure numbers and the solid circles locate the current meter data of Table 1.

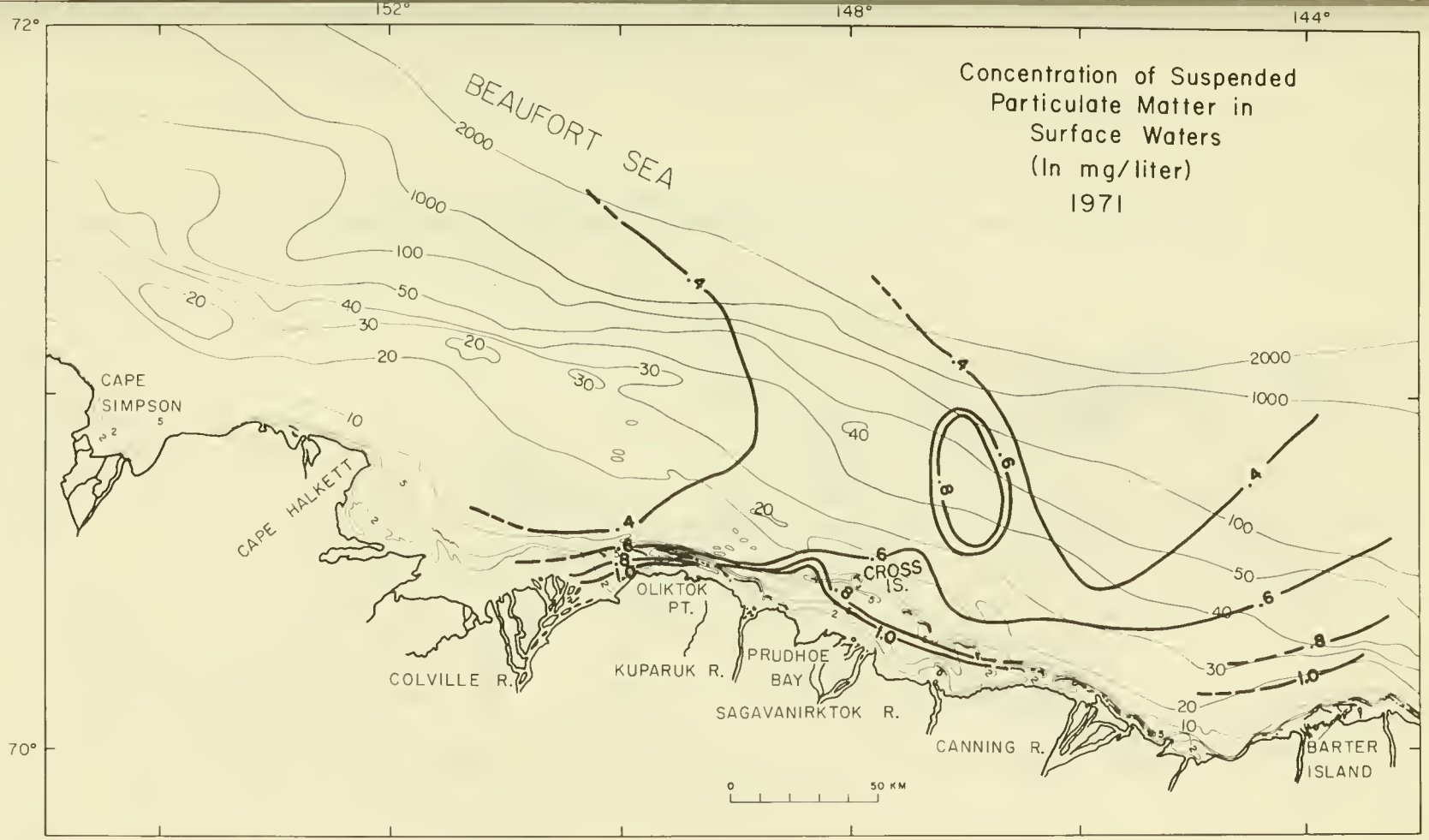

Figure 2.–Concentration of suspensates in the surface waters during August and September, 1971 off the northern coast of Alaska. Bathymetry in meters. Concentrations determined from weight increases of filters after passing 1 to 4 liters of sea water.

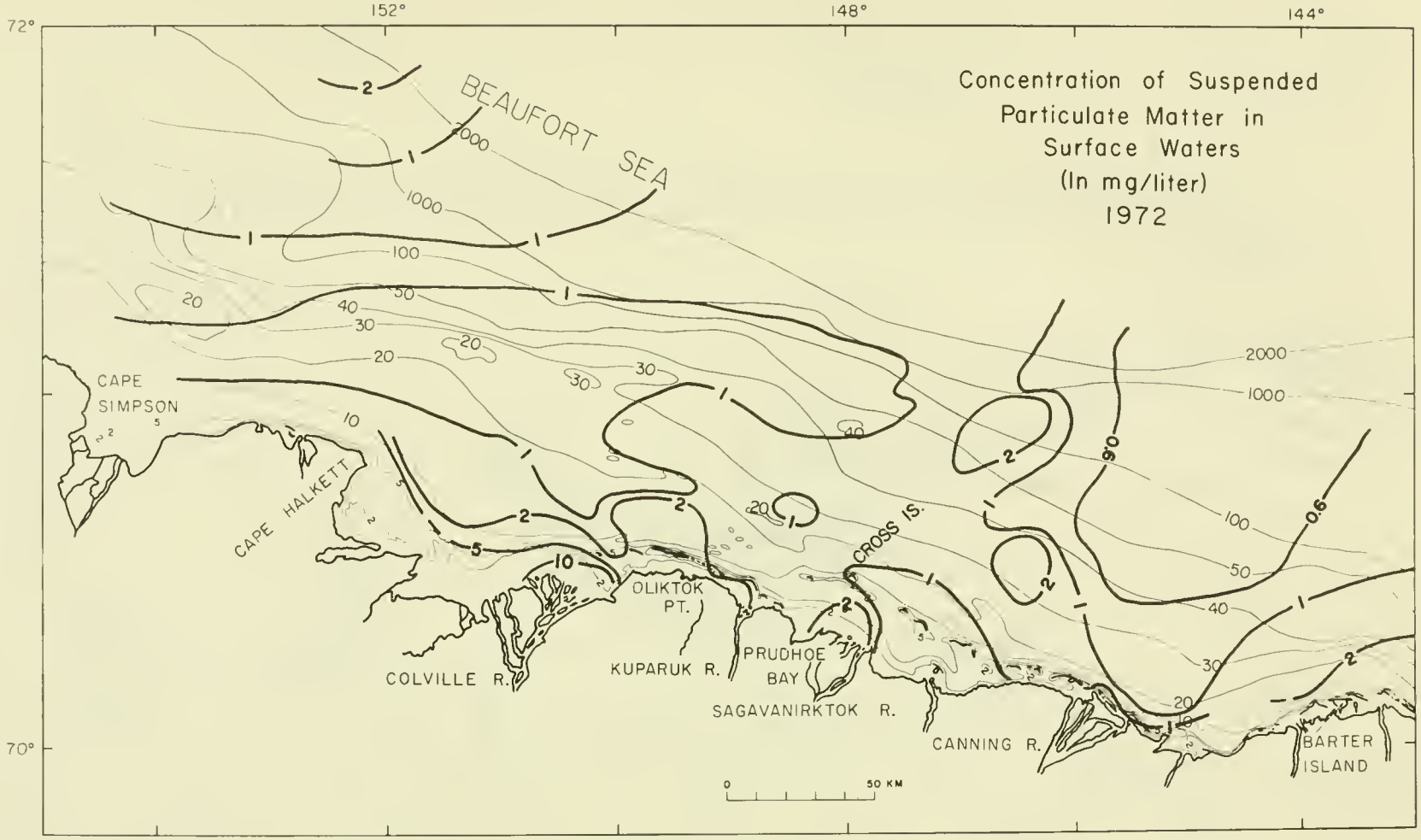

Figure 3.–Concentration of suspensates in the surface waters during late July and August 1972 off the northern coast of Alaska. Compare with Figure 2. Bathymetry in meters.

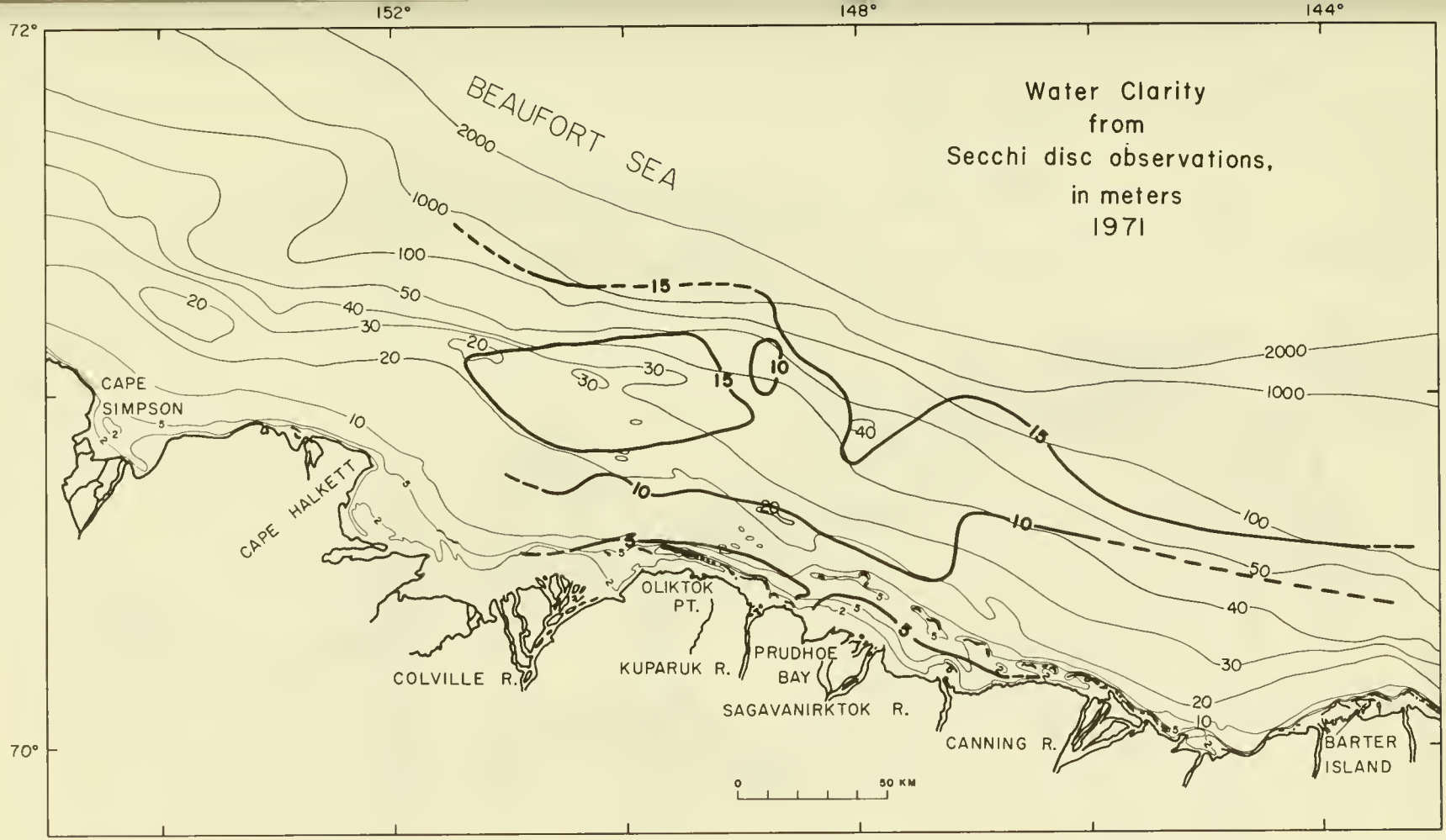

Figure 4.–Turbidity of the surface waters off the northern coast of Alaska during August and September 1971. Depth of water clarity from Secchi disc observations (in meters). Bathymetry in meters.

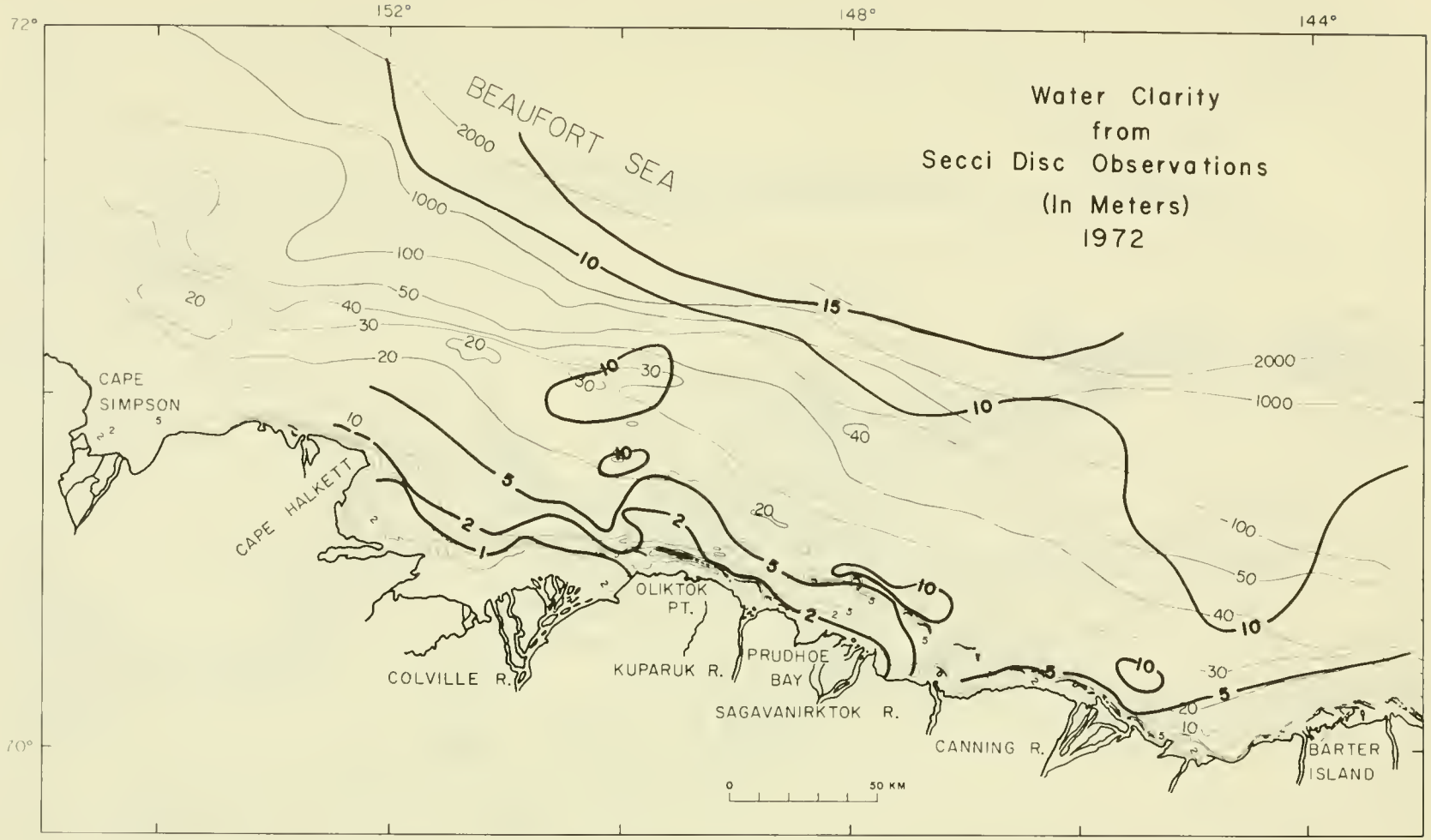

Figure 5.—Turbidity of the surface waters off the northern coast of Alaska during July and August 1972. Depth of water clarity from Secchi disc observations, in meters. Compare with figure 4. Bathymetry in meters.

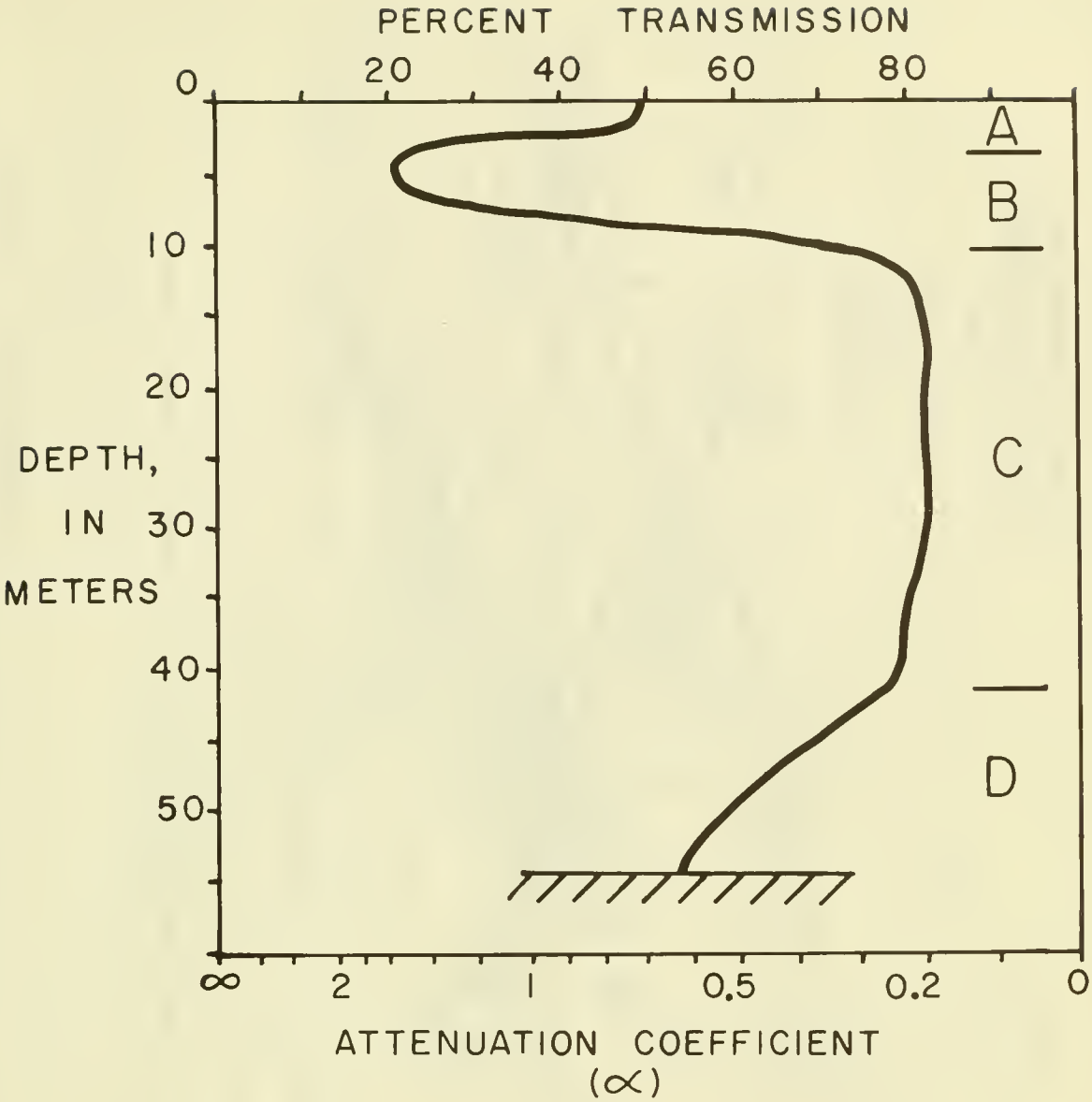

Figure 6.—Idealized light attenuation profile derived from transmissometer profiles recognized in the Alaskan Beaufort Sea, during the summer, 1971. Zone A represents ice melt water, Zone B, river runoff, Zone C typifies the light attenuation in arctic surface water, and Zone D shows the turbid layer which develops over the bottom on the shelf.

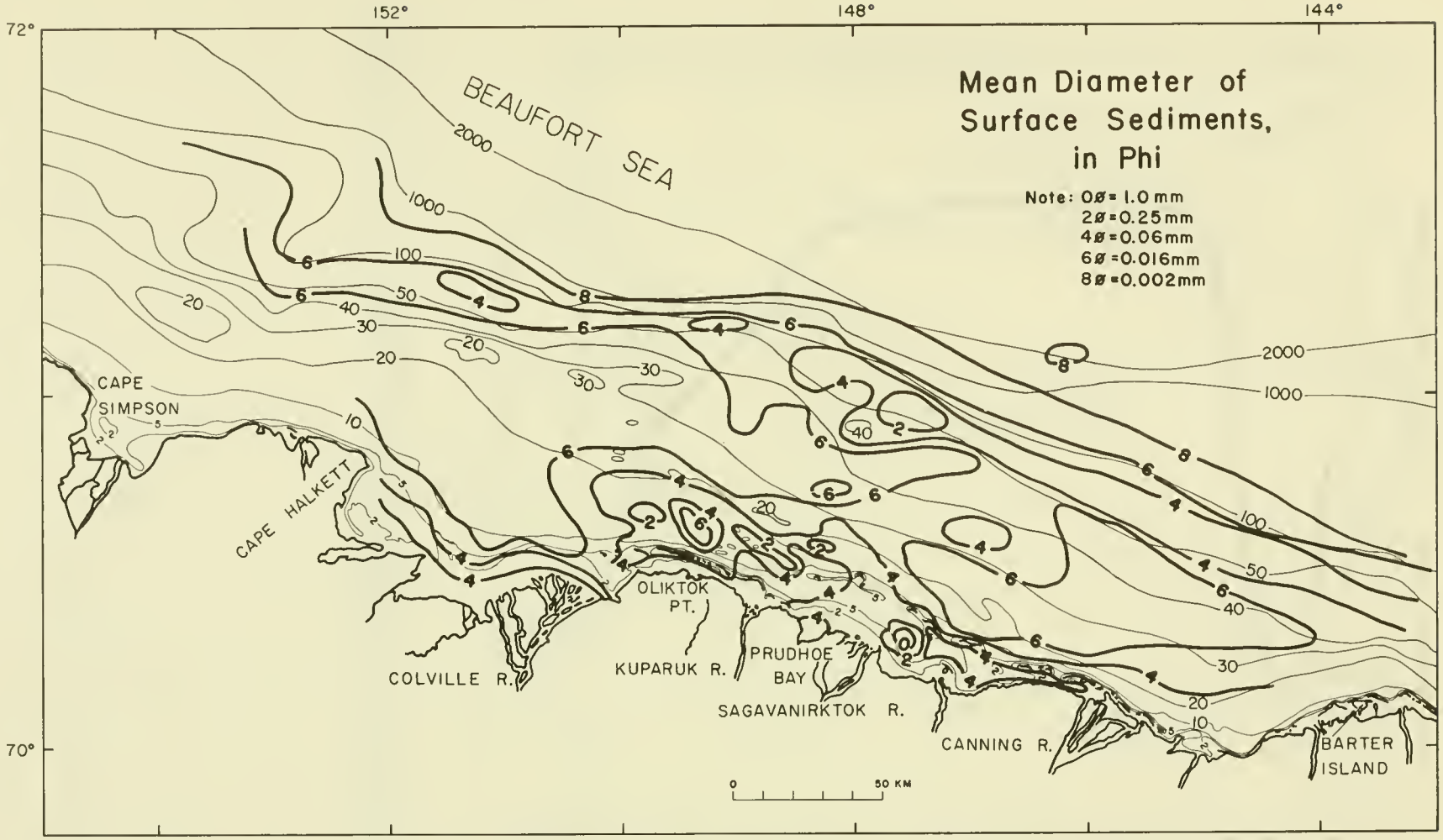

Figure 7.–Texture of the surface sediments expressed in terms of mean diameter determined by the Folk and Ward method. Bathymetry in meters.

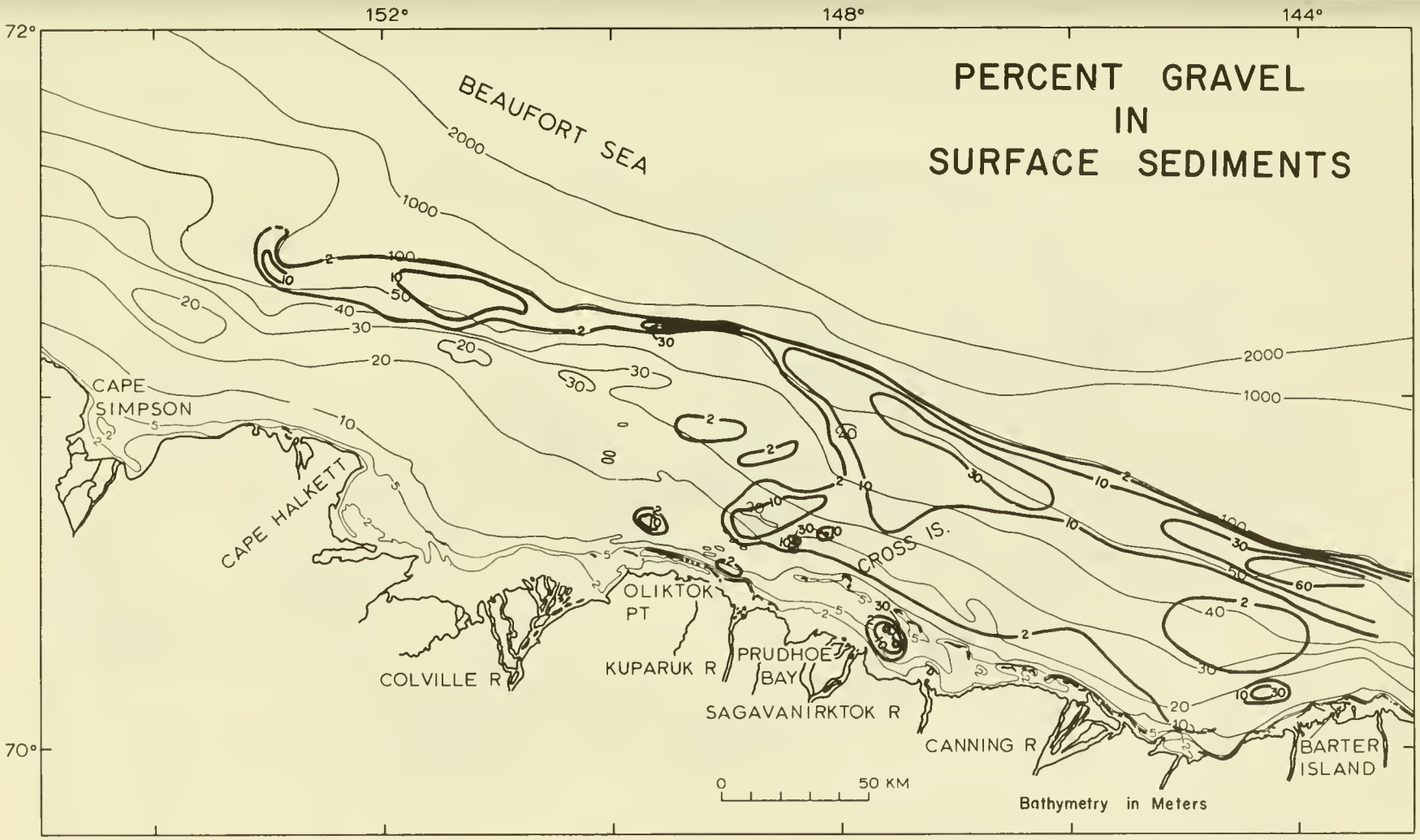

Figure 8.—Distribution (in percent) of gravel in the surface sediments of the Alaskan Beaufort Sea. Bathymetry in meters.

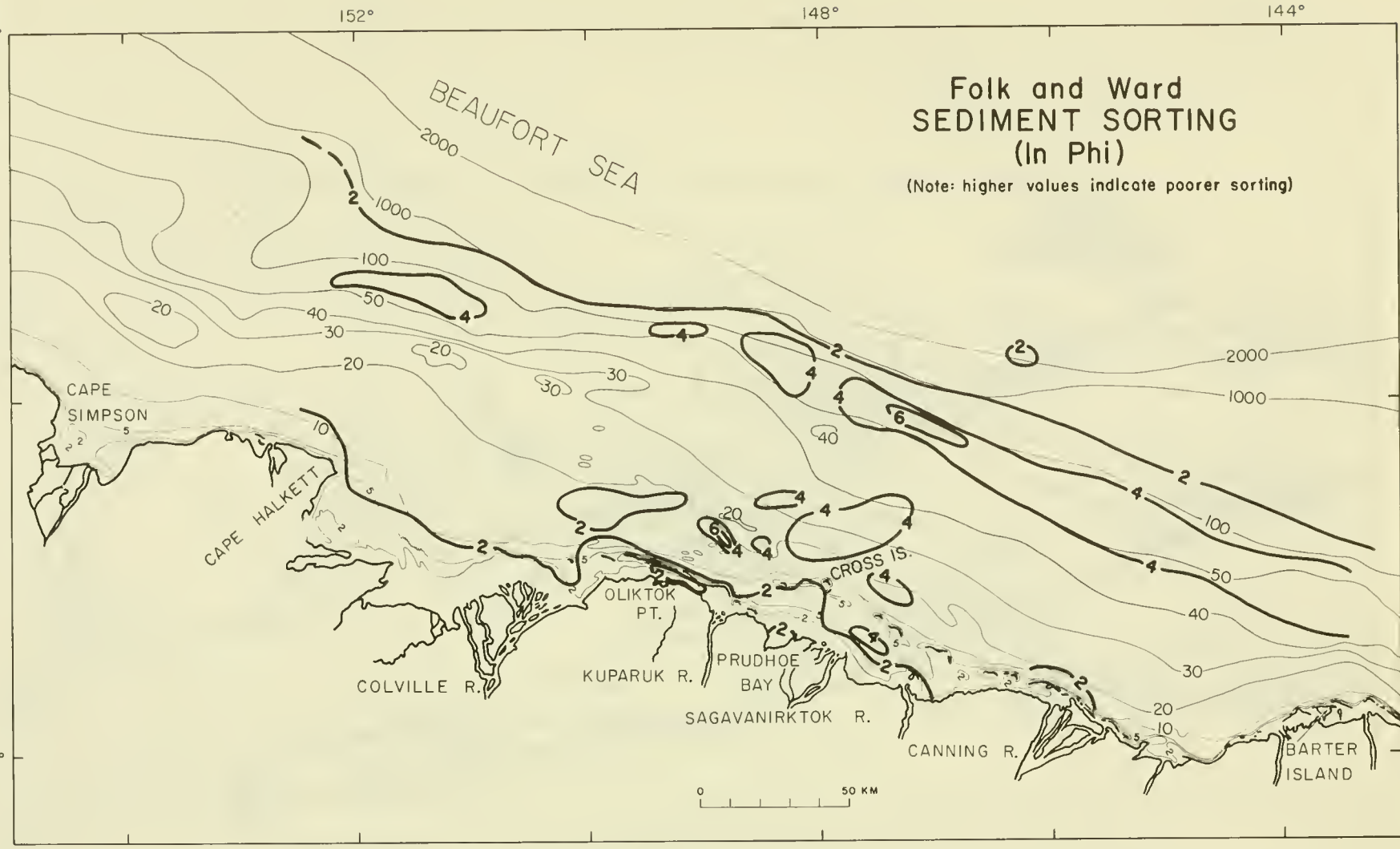

Figure 9.—Sediment sorting of the surface sample determined by using the Folk and Ward equation. Bathymetry in meters.

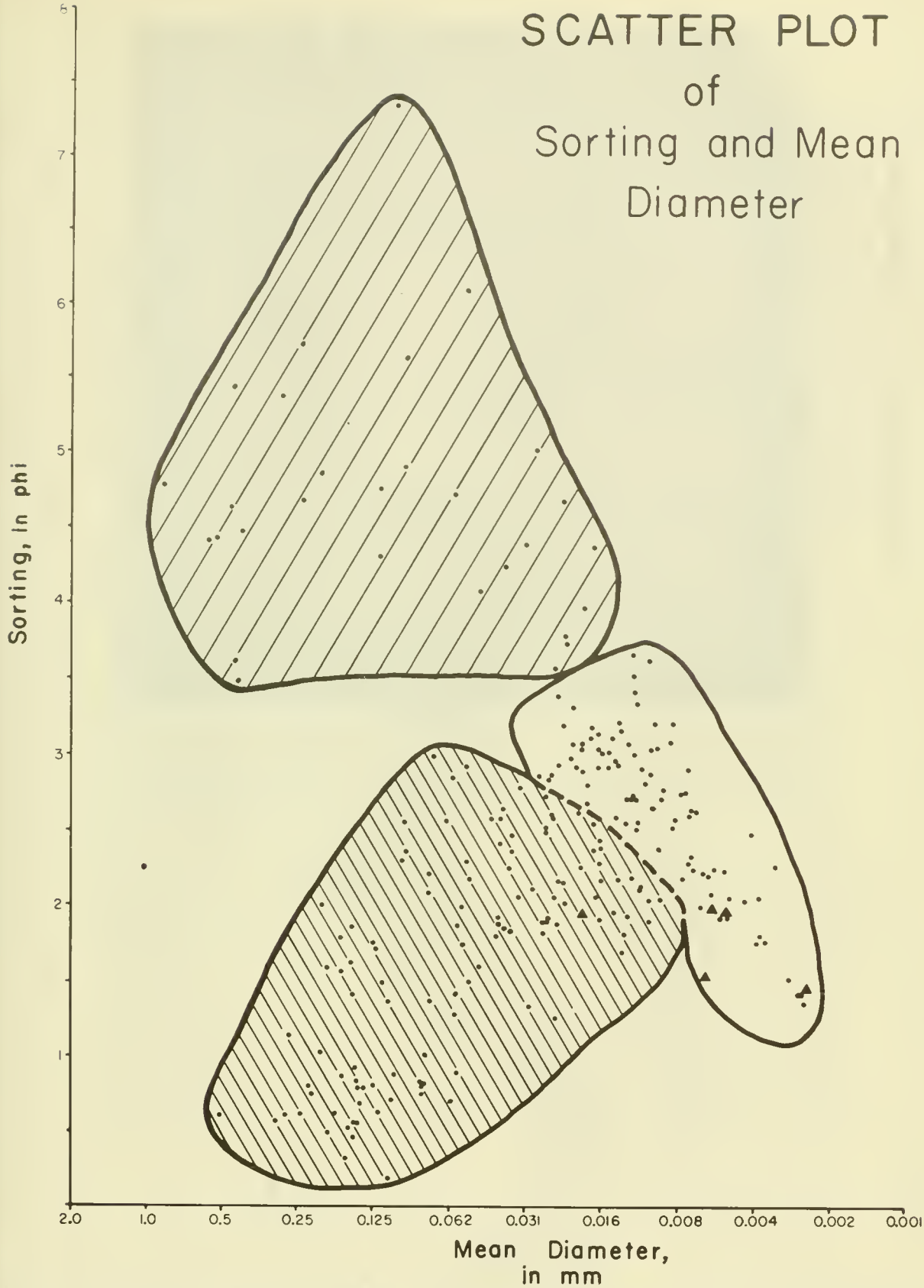

Figure 10.—Scatter plot of mean diameter and sorting of surface sediment samples. The lower the value on the ordinate, the better the sorting of the sediment. Dot,—sediment collected from surface. Small triangle,—sediment collected from ice flows. The arbitrary groupings are keyed to the overprinted pattern on figure 11.

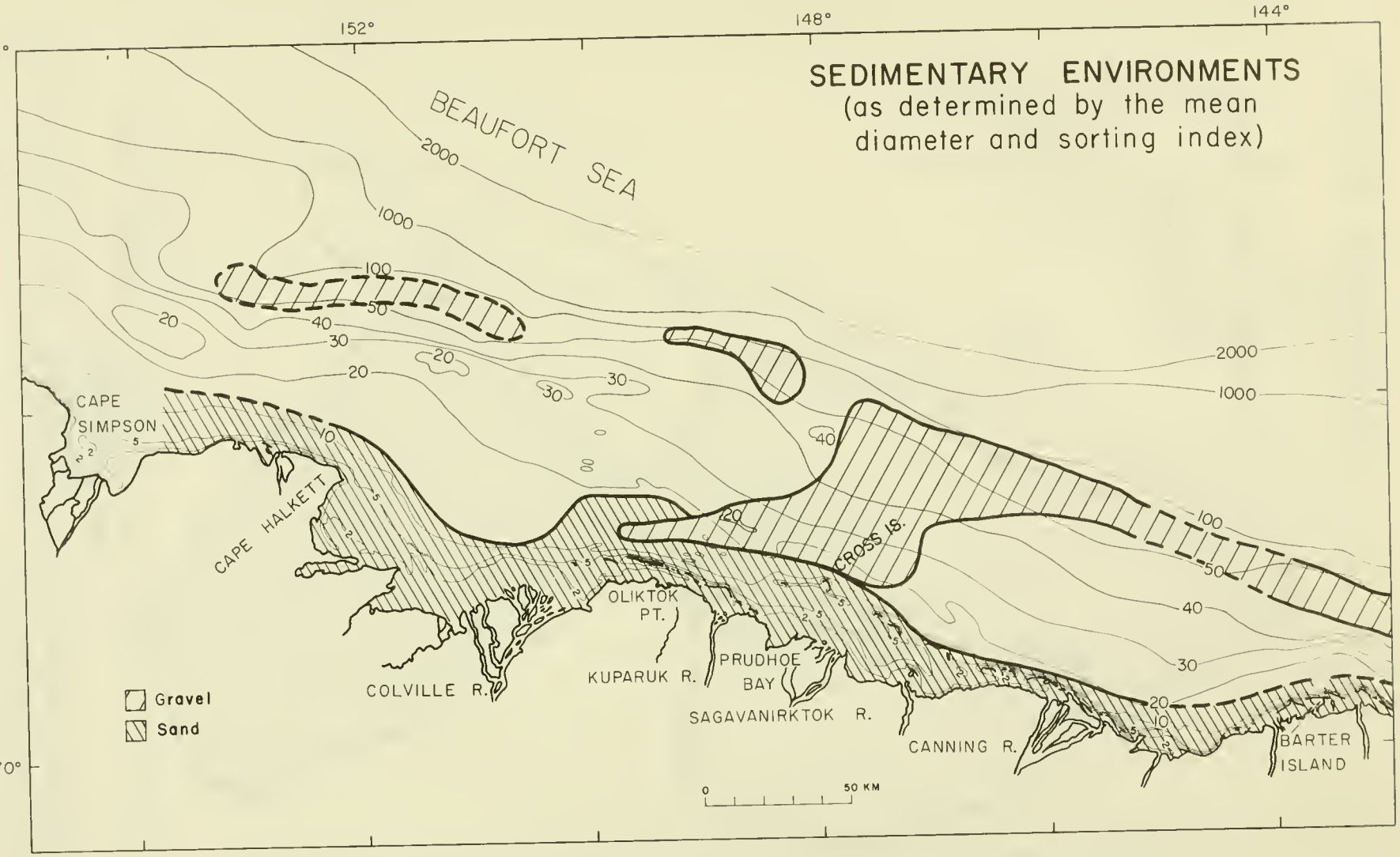

Figure 11.–Sedimentary environments as determined by the mean diameter and sorting index of figure 9. Bathymetry in meters.

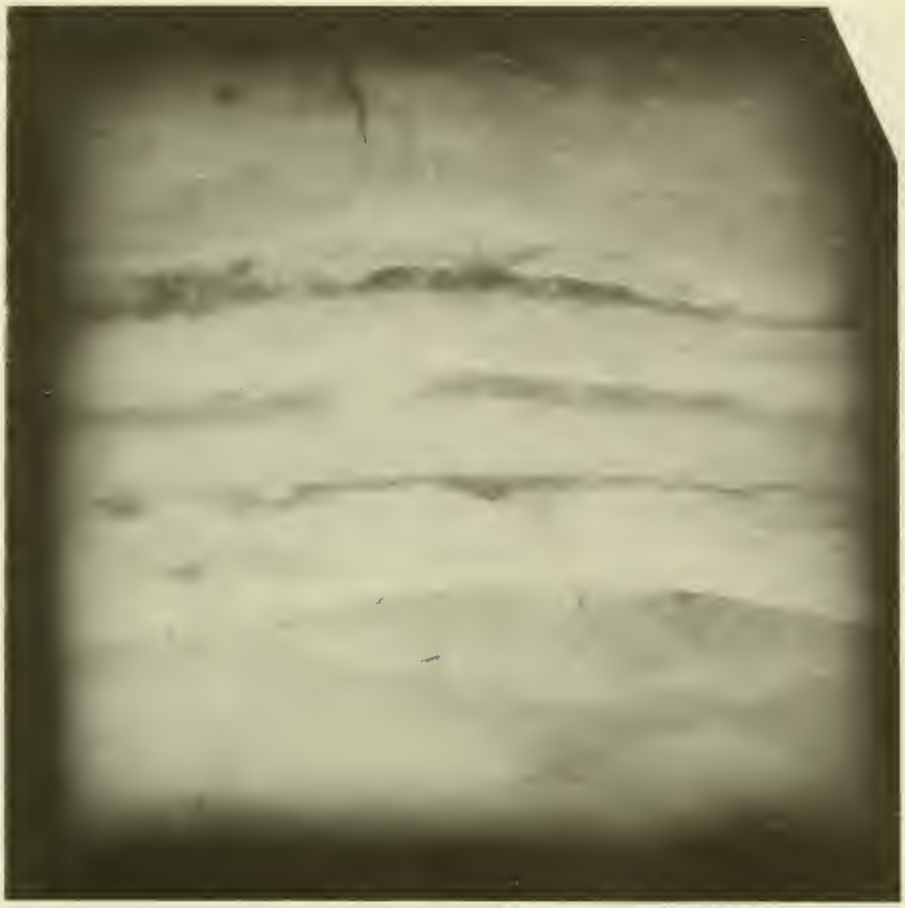

Figure 12. Inshore facies. Radiograph of a box core sample taken at 18 m water depth at station 46 north of the Colville River in 1972 (see Barnes and others, 1973 for details of location). The core is about 30 cm wide. The dark bands are silty sediments and the light bands are sandier sediments. Note the absence of bioturbation compared to figure 14.

Figure 13. Midshelf facies. Radiograph of a box core sample taken at 28 m water depth between the Canning and Sagavanirktok Rivers (Station 71ARP-14). The core is about 30 cm wide. The light spots are pebbles. Note the lack of layering and the homogeneity of the gravel-mud mixture. As in the inshore facies there is a lack of bioturbation compared to figure 14.

Figure 14. Shelf break facies. Radiograph of a box core sample taken at 130 m water depth northeast of the Sagavanirktok River (Station 71ABP-18). The core is about 30 cm wide. Note the surficial gravel and the abundant bioturbation in the form of worm burrows down to 25 cm. The original radiograph also shows faint but well-developed horizontal layering in the muds below the zone of worm burrows. The dark spots in the lower part of the core are individual bivalve shells.

Figure 15. **Radiograph of a box core sample taken from the base of the slope at 1640 m water depth (Station 72ABP-19). Note the faint horizontal lamination, the lack of burrowing, and the absence of pebbles. The box core is about 20 cm wide. The pronounced irregular lack streaks are cracks in the core sample.**

Figure 16. Radiograph of a box core sample taken from the side of an ice gouge in the central part of the shelf north of Prudhoe Bay at 31 m water depth (Station 71ABP-38). This core was apparently taken on the side of an ice gouge. Note the sloping surface to the core and the tilted block in the lower portion of the radiograph. The box core is about 20 cm wide. The light "blobs" are pebbles.

Figure 17.–Bottom photograph of the central shelf at 33 m water depth (Station 72ABP-29) showing an area of older ice gouging. Note the abundant fauna and the subdued nature of the bottom relief. The bottom edge of the photograph is about 2 m wide. The starfish are about 10 cm in diameter.

Figure 18.–Bottom photograph of the central shelf showing an area of recent ice gouging. Note the sharp angular nature of the blocks of sediment and the absence of fauna. The bottom edge of the photograph is estimated to be about 3 m wide. Same station as figure 17 but about 100 m northwest.

Appendix A.—Summary of Geologic Station Data

GLACIER STATIONS, 1971

Station Number	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew	Secchi disk, in meters	α, at the surface*	Part. matter mg/l at the surface	Hg ppm	Cu ppm	Pb ppm	Zn ppm	As ppm
1	26		35.8	36.3	23.9	22.3	3.19	0.21	6	7.76	1.00	0.11	40	14	115	29
2	44	32.3	36.4	17.5	13.7	283.2	4.68	0.11		1.17	.71	0.01	20	24	68	14
3	45	10.0	39.6	15.3	35.0	37.9	4.27	0.01		1.20		0.01	30	23	117	27
4	60								14	1.71	.62					
5	106	6.2	3.9	23.7	66.1	2.3		−0.33	16	1.47	.52	0.04	25	19	141	9
6	507	0.0	1.5	32.2	66.3	2.6	1.41	−0.64	11	1.43	.58	0.03	40	20	180	10
7	509	0.0	0.6	33.3	66.1	2.6	1.41	−0.48	17	.92	.25	0.15	25	20	160	10
8	81	2.8	48.5	24.1	24.5	30.8	3.00	0.37	21	.82	.30	0.04	15	15	107	29
9	56	20.4	40.5	15.9	23.1	94.7	4.89	0.11	20.5	.78	.32	0.06	25	16	95	8
10	49	0.0	29.3	32.0	38.7	10.9	2.90	0.20	11	.97	.33		25			
11	33	1.9	31.0	30.0	37.0	11.7	3.00	0.16	8	.99	.42		20			
12	26	0.0	24.9	41.2	33.8	11.8	2.72	0.04	8	1.27	.69		20			
13	31	2.7	25.1	41.4	30.7	13.3	3.21	0.10			.78	0.04		15	92	19
14	28	7.8	15.3	40.5	36.3	11.9	3.66	−0.31		.73	.46		25			
15	32	0.1	71.8	13.3	14.7	71.8	2.94	0.72	9	1.17	.94		15			
16	46	6.2	40.1	25.3	28.3	21.5	3.73	0.17	12	1.31	.74	0.06		9	103	9
17	46	0.0	39.4	25.5	35.0	14.3	3.10	−0.10	10	.73			20			
18	125	18.0	12.1	40.0	30.0	53.3	6.08	−0.49	13	1.47	.90		30			
19	365	0.0	2.0	52.0	46.0	4.3	2.03	0.05	19	.92	.44		25			
20	>2000	0.0	0.4	35.4	64.2	2.9	1.51	-0.46	16	.37	.39		25			
21	>2850	0.0	0.5	31.5	67.9	2.5	1.35	-0.56	20	.36	.83		30			
22	560	0.0	1.6	41.6	56.7	3.5	1.75	-0.43	19	.73	.59	0.07		15	140	30
23	27	18.1	18.1	23.7	40.0	28.6	5.06	-0.56	8	.99	.85	0.02		16	90	8
25	26	3.1	13.2	39.8	43.9	7.2	2.90	-0.37	13	.99	.63	0.02		15	107	19
26	29	12.3	28.0	26.9	32.8	22.4	4.66	-0.31				0.02		13	96	18
27	47	31.5	49.7	7.8	11.0	417.5	4.47	-0.05		.92	.39		10			
28	62	0.0	39.6	30.0	30.3	17.2	3.11	0.11	20		.59		15			
29	310	0.0	6.1	44.8	49.1	5.2	2.23	-0.23	20	.69	.27		25			
30	93	0.0	50.3	21.9	27.8	25.9	2.72	0.58		.63		0.08	20	10	90	20
31	52	0.0	42.2	22.2	35.6	16.3	2.91	0.24	19	.62		0.04	15	15	100	20

*α is the attenuation coefficient of light in water.

GLACIER STATIONS, 1971 (cont.)

Station Number	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew	Secchi disk, in meters	α, at the surface*	Part. matter mg/l at the surface	Hg ppm	Cu ppm	Pb ppm	Zn ppm	As ppm
32	34	13.7	57.5	14.1	14.6	89.0	3.86	0.20	15.5	.84	.22	0.01	15	9	60	9
33	41	0.0	33.4	32.8	34.0	15.6	2.91	0.08	16	1.61	.59	0.02	20	15	100	20
34	38	3.9	29.9	28.1	38.1	14.7	3.36	-0.23	12	.54	.44	0.02	35	10	96	10
35	27								10	.84						
36	22	41.6	37.4	11.0	9.9	566.4	4.41	0.34	11	.65	.37	0.02	20	6	47	12
37	33	15.2	38.8	21.9	23.9	60.4	4.7	0.10		.65		0.04	20	8	72	17
38	31	1.5	19.6	35.4	43.4	3.04	-0.40			.65	.59	0.01	25	15	98	20
39	36	0.0	22.9	35.8	41.3	9.2	2.70	-0.24				0.01	25	15	100	20
40	37	0.8	40.4	29.1	29.6	19.6	2.91	0.36	11	.65	.71	0.01	20	10	90	20
41	47	0.0	49.3	23.6	26.1	23.2	2.93	0.55	13	.63	.56	0.01	15	10	85	20
42	> 450	12.6	45.6	21.8	19.9	47.7	4.07	0.22	25	.73	.56	0.01	20	13	74	26
43	118	0.0	7.2	49.9	42.8	6.0	2.20	-0.17	25	.30	.34	0.02	35	20	140	30
44	48	20.3	32.7	24.8	22.0	92.8	5.57	-0.18		.58	.46	0.02	20	8	76	16
45	39	0.0	28.3	37.5	34.2	12.5	2.70	0.12		.58	.49	0.02	20	15	100	30
46	36	0.8	22.2	33.2	43.7	8.9	2.76	0:28		.69		0.07	25	15	100	20
47	33	0.0	16.3	35.8	47.8	7.0	2.59	-0.39		.73	.41	0.04	30	15	120	30
48	23	8.3	21.0	36.9	35.7	18.3	3.96	-0.29	10.5	.53	.71	0.03	25	14	92	18
49	22	14.2	49.9	20.0	15.8	102.2	7.31	-0.13	11	.58	.41	0.03	15	9	56	17
50	24	2.2	11.8	43.2	42.7	6.9	2.64	-0.27	12	.53		0.03	30	15	98	20
51	32	3.5	20.0	32.5	43.9	9.6	3.19	-0.40	12	.65	.44	0.01	30	10	82	19
52	37	1.5	17.5	43.3	37.6	10.0	2.64	-0.05		.53		0.01	25	10	94	20
53	37	0.3	37.8	32.0	29.8	17.7	2.80	0.46	10	.96	.41	0.02	20	10	75	20
54	48	0.0	49.6	27.4	22.9	24.7	2.86	0.55	9	.46		0.02	15	10	70	20
55	302	0.0	3.7	54.5	41.8	6.4	1.99	0.16	13	.53		0.01	25	15	120	10
57	1565	0.0	0.6	38.3	61.1	3.7	1.81	-0.51		.53		0.01	30	15	170	30
58	980	0.0	0.8	44.5	54.7	4.9	2.05	-0.45	13	.49	.46	0.03	30	15	120	30
59	192								13	.48	.39					
60	63	39.1	22.6	18.4	19.9	239.8	5.66	0.03			.41	0.01	25	9	61	12
61	50	0.0	48.9	29.3	21.7	25.2	2.83	0.53		.46	.46	0.01	20	10	75	20
62	36	3.4	40.2	28.4	28.0	20.3	3.31	0.22	15	.51	.39	0.02	20	10	82	19

*α is the attenuation coefficient of light in water.

Appendix A.—Summary of Geologic Station Data (cont.)

GLACIER STATIONS, 1971 (cont.)

Station Number	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew	Secchi disk, in meters	α, at the surface*	Part. matter mg/l at the surface	Hg ppm	Cu ppm	Pb ppm	Zn ppm	As ppm
63	26	0.0	7.2	40.8	52.0	5.6	2.24	-0.41	14	.54	.49	0.03	35	15	120	20
67	20															
69	23	0.0	8.0	25.2	66.7	3.3	2.25	-0.93	16	.37	.27					
71	21	0.0	25.3	46.4	28.2	12.6	2.54	0.33	15	.73	.41	0.02	25	10	95	20
72	47	0.0	6.7	48.5	44.8	6.3	2.21	-0.16		.73	.39	0.06	25	10	110	10
74	93	2.2	19.3	46.9	31.5	12.3	3.07	-0.06	11			0.01	25	15	98	29
75	140	2.6	22.4	42.0	32.8	13.9	2.96	0.04	13	.54	.37	0.01	25	15	97	19
76	95									.54						
77	24	0.0	20.0	50.0	30.0	11.4	2.50	0.22	14		.41	0.01	15	10	90	20
78	29									.65	.27	0.01	10	20	140	20
79	27	0.0	14.1	45.2	40.7	8.3	2.51	0.12	12.4	.97		0.04	25	15	110	20
80	33	3.2	11.0	39.4	46.3	6.7	2.62	-0.38	16	.48	.37	0.01	30	15	126	19
81	47	0.0	40.3	29.7	29.9	18.6	2.89	0.34	17	.53	.34	0.02	20	10	100	20
82	45	0.0	26.6	39.3	34.0	11.9	2.71	0.08	19	.60	.37	0.01	25	10	100	10
83	257	0.0	11.9	44.6	43.5	7.0	2.31	-0.23	14	.69	.27	0.01	25	10	120	10
84	1000	0.0	0.8	45.4	53.7	3.8	2.05	-0.21		.69	.20	0.02	30	15	130	20
85	1054	0.0	0.7	44.7	54.6	3.9	1.74	-0.32	19		.39	0.02	30	15	140	20
86	2150										.39					
87	97	0.0	23.9	44.4	31.6	11.3	2.55	0.18	14		.32	0.04	20	10	140	20
88	58	0.0	24.6	52.1	23.3	15.6	2.38	0.67			.68	0.01	20	10	100	20
89	100	10.8	23.1	37.8	28.3	21.8	3.78	-0.06			.39	0.04	20	9	98	18
90	24	0.0	3.6	50.2	46.2	5.7	2.07	-0.20			.37	0.01	30	10	130	20
91	52	0.0	7.9	54.3	37.7	7.5	2.18	0.02				0.01	25	10	130	10
92	38	0.0	1.4	49.4	49.1	5.0	1.96	-0.26				0.01	30	15	170	20
93	31	0.0	8.6	49.8	41.6	6.9	2.24	-0.09				0.04	30	10	120	20

*α is the attenuation coefficient of light in water.

GLACIER STATIONS, 1972

Station Number	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew	Secchi disk, in meters	α, at the surface*	Part. matter mg/l at the surface	Hg ppm	Cu ppm	Pb ppm	Zn ppm	As ppm
1	25								4		2.66	0.02	25	5	60	20
2	44	42	31	10.9	15.6	466.5	5.41	0.32	8		1.13					
3	125								6		0.88					
4	455								9		0.71					
5	915								14		0.60					
6	506								12		0.44	0.06	35	10	110	30
7	350								12		0.31	0.01	35	10	100	20
8	135	4	23	29.3	43.5	10.2	3.63	-0.42			0.67	0.04	25	10	80	20
9	51	82.1	7.0						13		0.46	0.02	25	5	75	20
10	37	0	28	29.3	42.4	10.0	3.03	-0.23	11		0.79	0.03	25	5	75	20
11	16	31	42	12.5	14.5				4.5		1.43	0.04	20	10	60	10
12	39	0	75	15.0	10.4	98.1	2.55	0.67	9		0.59	0.02	15	5	50	20
13	25		45	29.0	25.5	24.5	3.39	0.28	12		0.59	0.03	20	5	65	20
14	37		37	19.5	43.2	11.9	3.40	-0.22	6.5		0.73	0.01	25	5	75	20
15	37										0.30	0.02	20	5	55	20
16	38		32	25.7	42.4	8.8	3.07	-0.27	12		0.34	0.03	25	10	85	20
17	300								11		0.64	0.03	25	10	95	30
18	1062								12		0.50					
19b	1640	0	28	34.2	37.8	11.4	3.34	-0.33	20		1.30	0.03	25	10	85	20
20b	996								13		0.86	0.02	25	10	100	20
21	364								3		2.33					
22	109	63	17	1.6	18.4				3		2.38	0.02	20	5	80	20
23	47	42	25	13.4	19.6				10		0.82	0.01	20	5	70	20
24	36								9.5		2.27					
25	26								5		1.71					
26	17	0	17	41.3	41.3	7.7	7.74	-0.21	9.5		1.48					

*α is the attenuation coefficient of light in water.

Appendix A.—Summary of Geologic Station Data (cont.)

GLACIER STATIONS, 1972 (cont.)

Station Number	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew	Secchi disk, in meters	α, at the surface*	Part. matter mg/l at the surface	Hg ppm	Cu ppm	Pb ppm	Zn ppm	As ppm
27	23	0	23.0						7		0.84	0.02	30	5	85	20
28	26										1.15	0.01	25	5	85	20
29	43								9		1.52					
30	58								6		7.00	0.01	20	5	70	10
31	98	44.0	26	13.1	16.2	301.5	5.37	0.12	13		0.58	0.01	20	5	65	20
32	678								11		1.26	0.03	30	10	110	20
33	980								17		0.62					
34	995								9		1.19					
35	490								14		0.64					
36	307								9		0.56	0.02	25	10	95	20
37	43	0	47	22.1	30.5				5		0.58					
38	46								4		0.72					
39	33										1.02					
40	27								11		0.68	0.01	25	5	80	20
41	19								9		1.02	0.01	20	5	60	20
42	23								5		1.71					
43	32								9.5		1.34	0.01	15	5	55	20
44	46	0	26	37.2	37.2	10.0	2.86	-0.14	10		0.94	0.02	30	10	95	20
45	353	0	40	33.7	26.1	17.5	3.17	0.26	9.5	.69	0.73	0.01	15	5	65	20
46	18								9	1.20	1.67					
47	24								5	1.11	1.48					
48	28								14	.27	0.66					
49	44	0	36	32.7	31.1	13.3	3.15	0.09	6.5	.89	1.11	0.01	25	5	75	10
50	109	0	34	39.1	26.4	16.2	3.03	0.17	4	1.11	0.72	0.01	30	5	85	30
51	450±								7	1.20	0.75					
52	870									.87	0.95					
53	2130								19		0.73					
54b	230								14		0.67	0.03	25	10	95	30
55	1024								6	1.05	1.00					
56	576								4.5	.80	1.22					
57	219										0.86					

*α is the attenuation coefficient of light in water.

GLACIER STATIONS, 1972 (cont.)

Station Number	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew	Secchi disk, in meters	α, at the surface*	Part. matter mg/l at the surface	Hg ppm	Cu ppm	Pb ppm	Zn ppm	As ppm
58	53	0	49.0	22.7	27.9	20.9	3.07	0.51		1.27	0.74	0.01	20	5	75	20
59	26								8	.64	0.83					
60	19								6.5		1.09	0.01	25	5	75	20
61	19								11	.87	0.58					
62b	2020								10	.97	2.10	0.01	25	5	90	20
63	443								10	1.11	1.76					
64	500								8.5	.97	0.61					
65b	190								6		0.62					
66	60								10	.97	6.85	0.01	30	10	85	20
67	48	0	43.0							.89	0.29	0.01	25	5	60	20
68	18	0	26	36.9	37.2	12.0	3.51	-0.22	7	.78	0.51	0.01	30	5	85	20
70	18								7		0.37					
71	28										0.97					
72	48										1.43	0.01	30	5	80	20
73a	55								7							
74	23										1.24					
75	50								12	.73	1.50					
76	100								8.5	.84	0.62					
77	19									1.35	1.55					
78	115								8		1.04					
79	149								9		1.51					

*α is the attenuation coefficient of light in water.

R/V Natchik Stations, 1970

Station Number	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew
A	3.5	0	5.3	86.8	7.9	23.5	1.26	0.87
B	1.0	13.4	76.4	7.6	2.7	196	2.01	-0.35
1	2.5	3.4	83.7	9.5	3.4	150	1.42	0.30
3	10.0	0	99.0	1.0	0	504	0.61	-0.13
4	10.0	0	91.5	5.8	2.7	199	1.04	0.11
5	12.0	1.2	61.3	22.9	14.6	60.0	2.85	0.56
6	13.0	0	98.1	1.9	0	302	0.59	0.19
7	16.0	0	98.8	1.2	0	240	0.63	-0.29
8	15.0	0	94.2	4.3	1.5	140	0.69	0.31
9	13.0	0	34.9	34.7	25.4	18.7	3.04	0.21
10	10.5	0	69.2	22.3	8.5	70.8	1.83	0.53
11	3.0	0	66.3	29.3	4.5	1.21	1.72	0.31
12	3.0	0	22.1	62.8	15.1	21.6	2.02	0.38
13	1.5	0	12.1	80.4	7.6	30.0	1.38	0.39
14	2.0	0	18.6	66.3	15.0	21.9	2.16	0.31
15	4.0	0	94.5	4.8	0.8	148	0.57	0.58
16	19.0	0	80.1	9.0	10.9	95.4	2.30	0.65
17	11.0	0	99.4	0.6	0	279.4	0.61	0.24
18	2.0	0	95.4	4.6	0	118	0.64	-0.11
19	13.0	0	97.6	1.7	0.7	216	0.76	-0.09
20	10.5	0	95.5	3.8	0.7	222	0.82	0.19
21	16.0	0	34.7	44.0	21.3	19.1	2.62	0.28
22	20.0	5.5	36.8	32.8	24.9	23.8	3.57	0.17

R/V NATCHIK STATIONS, 1971

Station Number	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew	Secchi disk, in meters	α, at the surface*	Part. matter mg/l at the surface	Hg ppm	Cu ppm	Pb ppm	Zn ppm	As ppm
1	3.5	0.0	73.7	19.1	7.1	58.7	1.87	0.54	1.5	3.17	.92	0.01	15	10	70	20
2	2.6	0.0	5.7	77.8	16.4	13.0	1.69	0.39	2.5		>4.6	0.04	15	10	60	20
3	8.5	0.0	29.8	54.2	15.9	23.4	2.16	0.47	6.0	3.96		0.02	15	20	140	20
4	11.3	0.0	62.4	32.3	5.3	75.4	1.37	0.40	10	1.27	.76	0.03	10	10	60	20
5	6.7	2.9	79.7	12.9	4.4	152.8	1.86	0.34		1.66	.44	0.02	20	10	53	29
6	4.6	0.0	98.3	1.7	0	161.5	0.32	1.09	4	>4.6	1.7	0.01	15	15	75	10
7	7.6	0.0	80.6	13.5	5.9	115.8	1.50	0.64	6.5	1.97		0.03	15	15	75	10
8	6.7	0.0	48.0	38.5	13.4	39.8	2.41	0.41		2.04		0.03	15	15	75	20
9	5.5	39.7	39.7	14.6	5.9	532.2	4.43	-0.19		1.90	1.12	0.02	15	9	45	12
10	5.0	0.0	8.20	12.3	5.7	168.4	1.79	0.54	3.5	75.00		0.05	15	10	65	20
11	8.5	0.0	14.8	66.6	18.6	15.7	2.17	0.03	7.5	2.04	1.01	0.12	25	20	140	20
12	5.2	0.0	45.9	39.9	14.2	38.5	2.64	0.23	40	75		0.02	20	20	100	30
13	4.0	0.0	28.5	50.2	21.3	16.0	2.43	0.21		2.41		0.02	20	20	120	30
14	4.9	0.0	11.9	69.0	19.0	16.5	2.05	0.50		1.97	.43	0.02	20	20	100	30
15	2.6	14.7	57.1	22.8	5.3	92.1	2.36	-0.26	0.6	4.61		0.07	15	13	81	26
16	7.0	0.0	56.7	30.6	12.7	36.1	2.25	0.61	4.0	4.6	1.77	0.01	15	15	100	20
17	4.6	1.7	16.0	60.8	21.4	16.1	2.28	0.39	2.0	75		0.04	20	15	99	10
18	13.7	0.0	12.7	49.4	37.8	7.2	2.28	-0.07	7.0	2.04	.43	0.02	25	20	160	20
19	8.8	0.0	45.1	35.1	19.7	26.1	2.52	0.56	6.0	4.61		0.01	15	10	120	20
20	14.6	0.0	24.6	48.2	27.1	13.9	2.58	0.24	6.0	3.51	1.12	0.01	20	5	85	20
21	16.8	3.0	89.1	4.6	3.2	196.1	1.35	0.16	7.0	3.00		0.04	10	5	39	10
22	20.4	40.0	35.9	14.1	9.9	466.5	4.63	0.11	8.0	3.00	.43	0.01	10	3	33	12
23	11.0	2.1	42.0	42.9	12.9	39.6	2.58	0.24	2.5	4.31	1.72	0.03	15	5	59	20
24	17.8	1.6	93.7			145.6	0.84	0.02	6.5	3.86		0.04	15	5	54	20
25	18.3	19.7	41.7	18.2	20.2	118.4	4.75	0.12	6.5	4.16		0.02	25	8	68	16
26	1.7	0.0	98.4	1.5	0	189.5	0.50	-0.22	9.0	4.16		0.02	5	5	20	20
27	19.2	0.7	40.7	35.7	22.8	20.8	2.98	0.39	14	3.57		0.02	20	5	74	30
28	18.0	1.6	87.2	4.9	6.2	167.2	1.56	0.25	11	4.62		0.04	5	5	39	30
29	14.6	23.6	59.2	9.0	8.1	429.3	3.49	0.05	6.5	5.11		0.02	10	4	34	15

*α is the attenuation coefficient of light in water.

Appendix A.—Summary of Geologic Station Data (cont.)

R/V NATCHIK STATIONS, 1971 (cont.)

Station Number	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew	Secchi disk, in meters	α, at the surface*	Part. matter mg/l at the surface	Hg ppm	Cu ppm	Pb ppm	Zn ppm	As ppm
30	7.6	1.0	75.1	20.2	3.7	152.8	1.63	0.38	5.0	5.98		0.04	20	5	30	10
31	7.6	0.0	20.2	51.2	28.6	14.7	3.02	-0.23	4.5	5.11		0.08	30	10	85	20
32	8.5	0.0	15.0	62.8	22.2	11.8	2.18	0.02	6.5	5.98		0.04	25	5	95	20
33	16.2	0.0	42.8	30.0	27.1	17.9	2.68	0.50	7.0	4.16		0.04	15	5	70	10
34	18.0	0.0	59.2	20.0	20.7	33.3	2.77	0.66	14.5	5.98		0.04	15	5	70	20
35	19.8	0.0	33.8	28.2	37.9	10.7	2.81	0.21	15.5	4.94	.35	0.03	25	10	95	20
36	17.1	0.0	90.5	9.5	0	147.6	0.93	-0.06	8.0	6.54		0.03	5	5	45	10
37	2.1	0.0	34.0	50.0	15.9	26.1	2.49	0.16	1.5	7.77		0.15	20	10	80	10
38	1.5	0.0	45.0	41.3	13.6	35.6	2.46	0.31		9.16		0.20	20	5	75	10
39	2.1	0.0	35.4	55.7	8.5	40.9	1.80	0.38	1.5	9.16		0.15	15	10	65	20
40	10.4	0.0	7.2	70.7	22.0	9.2	2.04	0.32	5.0	4.31		0.22	35	10	100	20
41	14.0	0.0	96.4	3.5	0	150.7	0.46	-0.39	10.0	6.73		0.02	5	5	30	10
42	22.0	20.4	46.3	17.3	15.9	201.7	4.86	0.19	15.0	3.57		0.02	15	4	48	8
43	22.6	10.6	25.7	32.4	31.2	17.2	4.26	-0.43	13.0	6.73		0.02	25	9	76	9
44	11.0								8.0	6.93		0.16	25	10	100	10
45	3.4	0.0	99.1	0.9	0	156.0	0.52	0.25	4.0	7.34		0.03	5	10	50	10

*α is the attenuation coefficient of light in water.

R/V NATCHIK STATIONS, 1972

Station Number	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew	Secchi disk, in meters	α, at the surface*	Part. matter mg/l at the surface	Hg ppm	Cu ppm	Pb ppm	Zn ppm	As ppm
1	1.8								1.0	3.57	1.00					
2	2.1								1.1	2.61	4.38					
3	3.0								1.3	2.36	3.63	0.04	25	5	85	10
4	2.4								1.0	4.01	4.24	0.02	20	5	75	10
5	7.3								2.3	2.48	1.53					
6	5.5								2.3	2.87	1.27					
7	2.4								2.2	1.63	2.31					
8	3.7	0	11	67.6	21.4	10.2	2.04	0.04	2.5	1.27	3.35	0.08	25	5	80	10
9	6.0								2.8	1.63	2.71	0.01	10	5	35	10
10	7.9								2.5	1.39	1.78					
11	7.3															
12	17								12	1.28	0.51	0.02	25	5	80	20
13	1.60	0							11	.83	1.00					
14	8.0								5	1.05	0.90					
15	6.0								4.5	1.86	0.58	0.02	15	5	45	20
16	2.7	0	66.0	29.2	5.2				1.5	3.15	0.66	0.03	15	5	60	10
17	6.0								5.0	2.48	0.55					
18	13.0	0	16	50.5	33.5	8.0	2.56	-0.12	9.0	1.51	0.64	0.03	25	5	90	20
19	8.0								8.0	1.39	0.05					
20	13.4	0	33	48.0	18.6				8.0	1.74	0.45	0.02	20	5	70	20
21	13.4	0	22.0						5.0	3.01	0.79	0.01	20	5	65	10
22	3.0								2.3	3.42	1.35					
23	2.0	0	89	10.5	0					2.61	1.00	0.01	15	5	50	10
24	12.0	0	87	9.8	3.5	200.3	1.56	0.17	4.5	3.57	1.45	0.02	15	5	40	20
25	12.0								2.2	3.42	3.00	0.01	25	5	70	20
26	4.0								4	3.57	1.33	0.01	20	5	65	20
27	12.8									1.39	0.69					
28	19.0								15	2.74	0.73					
29	18.0								13	1.63	0.62					

*α is the attenuation coefficient of light in water.

Appendix A.—Summary of Geologic Station Data (cont.)

R/V NATCHIK STATIONS, 1972 (cont.)

Station Number	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew Skew	Secchi disk, in meters	α, at the surface*	Part. matter mg/l at the surface	Hg ppm	Cu ppm	Pb ppm	Zn ppm	As ppm
30	20.0	0	10.6						7	2.89	0.92					
31	23.0								13	1.05	0.61					
32	16.0								1.5	2.48	3.18					
33	21.0	0	11	41.1	48.2	4.0	2.46	-0.19	2.0	2.61	3.57					
34	20.0								2.3	4.78	2.05					
35	21.0								5.5	1.74	0.77					
36	3.7								0.6	13.5	31.06					
37	4.9								1.2	5.28						
38	14.0								3.2	2.49	1.84					
39	16.0								2	2.61	3.56					
40	6.0								1.1	6.93	6.15	0.03	30	5	90	20
41	14.0								1.5	6.35	3.05					
42	18.0								5	1.98	0.77					
43	14.0	0	76.0						2.3	4.16	1.96	0.02	15	5	55	20
44	12.0	0	26.0						4	5.45	0.99	0.02	30	5	90	20
45	7.0	0	38	48.2	13.3	32.4	2.05	0.66	1.0	8.68	14.63	0.03	20	5	75	20
46	19.0															
47	14.0															
48	10.0															

*α is the attenuation coefficient of light in water

R/V LOON STATIONS, 1971

Station Number*	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew
3	2.0	0	82.1	14.6	3.3	103	0.89	0.17
4	1.3	0	70.8	29.2	0	79.7	0.81	0.49
5	1.5	0	75.1	23.0	1.8	79.1	0.76	0.20
6	1.7	0	88.8	9.1	2.0	135	0.80	0.27
7	1.8	0	64.2	30.0	5.8			
8	1.2	0	53.1	39.5	7.4	51.8	1.88	0.48
9	3.6	0	9.0	71.0	20.0	12.3	1.93	0.27
10	7.0	0	10.1	72.9	17.0	15.7	1.91	0.33
11	10.7	0	9.7	64.9	25.5	10.9	2.13	0.25
12	3.0	0	1.4	77.0	21.6	10.1	1.90	0.26
15	1.0	0.4	59.5	22.9	17.3	52.9	2.92	0.60
16	3.0	0	6.35	56.6	37.1	5.3	1.92	0.02
18	2.7	4.4	10.1	71.0	14.5	18.8	2.26	0.23
19	1.5	0	37.4	58.5	4.0	57.9	0.89	0.24
20	1.7	0.3	72.3	22.3	5.1	123.3	1.76	0.50
21	2.6	0	12.7	65.6	21.6	11.0	2.11	-0.01
22	4.1	0	39.6	47.4	12.9	29.0	2.11	0.53
23	5.5	0	58.9	34.8	6.3	59.1	1.28	0.57
24	6.8	0	49.2	43.9	6.9	51.8	1.50	0.41
25	8.2	0	80.2	14.6	5.3			
26	2.4	0	44.7	43.6	11.7	39.6	1.93	0.58
28	0.9	0	50.9	46.5	2.6	60.4	0.71	0.15
29	0.9	0	93.8	6.2	0	176	0.63	0.99
30	2.1	0	82.1	17.2	0.8	123	6.82	0.27
31	3.3	0	65.3	28.2	6.5			
32	4.9	0	76.5	19.7	3.8	108	1.37	0.63
33	6.1	25.0	61.2	9.3	4.5	846	4.79	-0.56
34	8.5	0.5	32.2	48.1	19.2	24.2	2.61	0.26
35	7.6	0	32.5	51.9	15.6	23.7	2.06	0.61
36	7.3	0	39.1	40.8	20.1	24.2	2.59	0.46
37	7.0	0	62.9	25.3	11.9	53.7	2.30	0.63
38	6.1	0	45.5	40.8	13.8	35.2	2.36	0.42
39	3.7	0	88.2	11.8	0	142	0.80	0.42
40	77.0	42.0	57.2	0	0	1189	2.26	-0.33

*Station location given in Barnes and others, 1973.

R/V LOON STATIONS, 1972

Station Number	Depth, in meters	Gravel %	Sand %	Silt %	Clay %	Mean μ	Sort phi	Skew
73	0.5	0	60.3	35.1	4.6	59.1	1.42	0.61
74	0.75	0	70.8	26.9	2.2	77.5	0.82	0.22
75	1.5	0	40.5	51.7	7.8	40.9	1.87	0.42
76	1.0	0	24.4	68.1	7.5	27.4	1.89	0.06
78	1.5	0	64.1	32.9	3.0	73.8	1.00	0.49
80	1.5	0	56.1	38.3	5.6	76.9	2.21	0.46
81	1.2	0	89.0	9.4	1.6	159	0.86	0.40
82	1.6	0	83.6	14.9	1.5			
84	1.5	0	54.7	35.6	9.4	66.1	2.56	0.61
86	1.0	0	11.1	71.4	17.5	13.9	1.95	0.19
87	2.5	0	22.7	64.6	12.7	26.8	1.89	0.42
89	1.1	0	95.4	3.8	0.8			
90	1.5	0	86.0	14.7	0			
91	2.0	0	50.1	44.1	5.8	48.4	1.59	0.47
92	1.0	0	68.1	24.5	7.4	76.9	2.04	0.61
189	8.5	0	21.7	67.1	11.2	27.0	1.82	0.50
190	8.0	0	7.1	73.4	19.5	12.6	1.80	0.10
191	4.5	0	71.3	20.1	8.6	55.9	1.74	0.63
192	2.0	0	100	0	0			
193	5.2	0	42.0	48.9	9.2	39.0	1.85	0.41
194	4.5	0	99.0	1.0	0	14.6	0.55	0.10
195	5.4	0	24.7	48.2	27.1	16.9	3.14	-0.12
196	3.0	1.3	85.7	13.0	0	107	0.70	0.02
197	5.2	0	77.7	19.5	2.8	76.4	0.82	0.43
198	7.2	0	53.0	31.7	15.4			
199	10.0	0	26.2	53.0	20.8	17.1	2.53	0.31
200	12.5	0	42.6	27.3	30.1	14.0	2.93	0.16
202	2.0	0	56.3	29.5	14.1	42.7	2.54	0.60
203	2.6	0	22.4	67.1	10.5	24.7	1.87	0.28
204	3.2	0	39.4	49.2	11.4			
205	1.5	0	94.9	5.1	0	112	0.19	
206	1.2	0	98.6	1.4	0			
207	5.3	0	23.2	54.3	22.5	17.6	2.36	0.60
208	12.0	0	14.8	63.1	22.1	14.1	2.17	0.40
209	12.0	0	45.5	24.9	29.6			
210	10.5	0	14.5	59.2	26.3	9.7	2.37	0.04
211	3.0	0	44.9	47.5	7.6			

Appendix B.—Organic and Chemical Analyses of marine sediment samples, Beaufort Sea (Data in percent of dry weight)

Sample No.	71-ABP-5	71-ABP-6	71-ABP-12	71-ABP-21	71-ABP-42	71-ABP-43	71-ABP-45	71-ABP-47A	71-ABP-47B	71-ABP-49	71-ABP-71	71-ABP-88A	71-ABP-88B	Average
Sediment type	Clay	Clay	Silty Clay	Very Slightly Silty Clay	Sandy Clay	Slightly Silty Clay	Silty Clay	Silty Clay	Silty Clay	Sandy Silt	Clayey Silt	Clayey Silt	Silty Clay	
Sample depth (m)	106	500	26	2500	(?)	118	39	33 (0-2 cm)	33(2-10 cm)	22	21	58 (Surface)	(Subsurface)	
Moisture (%)	37	60	37	30	34	64	–	–	–	28	–	–		
Carbon														
Total	1.90	1.20	2.08	1.20	1.86	2.33	1.82	1.85	1.67	1.86	2.00	1.33	1.44	
Mineral	.84	.31	1.36	.10	1.04	1.27	1.01	.81	.72	1.40	1.17	.46	.49	0.845
Organic	1.06	.89	.72	1.10	.82	1.06	.81	1.04	.95	.46	.83	.87	.95	0.339
Organic matter[1]	1.80	1.51	1.22	1.87	1.39	1.80	1.38	1.77	1.62	.78	1.41	1.48	1.62	1.512
$CaCO_3$[2]	7.00	2.58	11.33	.83	8.66	10.58	8.41	6.74	6.00	11.66	9.75	3.83	4.08	7.035
Sulfur														
Total	.12	.10	.06	.12	.07	.11	.08	.08	.09	.08	.09	.05	.07	0.086
Free[3]	.0006	.0001	.0005	.0002	.0046	.0068	.0006	.0002	.0007	.0003	.0021	.0006	.0019	.0015
Bitumen	.0056	.0027	.0034	.0017	.0029	.0029	.0035	.0050	.0054	.0035	.0043	.0034	.0023	0.0035
Humate[4]	.1734	.2691	.1633	.2188	.1435	.2053	.2353	.1525	.1918	.1163	.2130	.2465	.3602	0.2063
Humic fraction	.0868	.1026	.0783	.0916	.0538	.1092	.1052	.0686	.0868	.0375	.1050	.1345	.2276	.0990
Fulvic fraction	.0866	.1665	.0850	.1272	.0897	.0961	.1301	.0839	.1060	.0788	.1080	.1120	.1326	.1079
Si	> 10	> 10	>10	> 10	>10	> 10	>10	>10	>10	>10	>10	>10	>10	>10
Al	7.	7.	5.	7.	5.	5.	5.	7.	7.	2.	5.	3.	5.	5.4
Fe	2.	3.	2.	3.	2.	2.	2.	3.	3.	1.5	2.	2.	2.	2.3
Mg	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.	1.	1.	1.	1.3
Ca	1.5	.7	2.	.5	2.	2.	1.5	1.5	.7	3.	2.	.7	1.	1.47
Na	2.	3.	1.5	3.	1.5	2.	1.5	2.	1.5	1.	1.5	1.5	1.5	1.81
K	3.	3.	3.	3.	2.	3.	2.	3.	3.	1.5	1.5	1.5	1.5	2.38
Ti	.2	.2	.2	.2	.2	.2	.2	.3	.3	.15	.15	.2	.2	0.21
Mn	.015	.30	.02	.30	.03	.02	.015	.03	.03	.02	.02	.015	.015	0.638
B	.015	.010	.077	.010	.007	.007	.007	.007	.007	.005	.005	.007	.007	0.0077
Ba	.07	.07	.05	.05	.05	.05	.05	.05	.05	.03	.03	.03	.05	0.048
Be	.00015	.00015	.00015	.00015	.00015	.00015	.00015	.00015	.00015	D	.00015	D	.00015	0.00015
Ce	D[5]	D	D	D	–[6]	D	D	D	D	–	D	D	D	D
Co	.0015	.0015	.001	.0015	.001	.001	.001	.0015	.0015	.0007	.001	.0007	.001	0.0011
Cr	.007	.007	.007	.007	.007	.007	.007	.007	.007	.005	.007	.007	.007	0.0068
Cu	.02	.02	.003	.003	.01	.003	.01	.02	.02	.015	.007	.0015	.015	0.0113
Ga	.003	.003	.0015	.003	.0015	.002	.0015	.003	.002	.001	.0015	.001	.0015	0.0019
La	D	D	D	D	D	D	D	D	D	–	D	D	D	D
Li	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Mo	–	.0003	–	.0007	–	–	–	–	–	–	–		–	0.0005
Nb	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Nd	D	D	D	D	D	–	–	D	D	–	–	–	D	D
Ni	.005	.003	.002	.003	.003	.003	.002	.003	.003	.0015	.002	.002	.002	0.0026
Pb	.002	.0015	.0015	.002	.0015	.002	.0015	.002	.0015	.0015	.0015	.0015	.0015	0.0016
Sc	.0015	.0015	.001	.0015	.001	.001	.001	.0015	.0015	.0007	.0007	.0007	.001	0.0011
Sr	.015	.02	.015	.015	.015	.015	.01	.01	.01	.01	.015	.01	.01	0.0130
V	.015	.02	.01	.015	.01	.01	.015	.015	.015	.007	.01	.007	.01	0.0122
Y	.0015	.0015	.0015	.0015	.0015	.0015	.0015	.002	.0015	D	.0015	.0015	.0015	0.0015
Yb	.0002	.0003	.0003	.0002	.0002	.00015	.0002	.0003	.0002	.00015	.0002	.0002	.0002	0.00022
Zr	.007	.007	.015	.007	.01	.007	.007	.007	.007	.007	.007	.01	.01	0.0083

[1]Organic matter calculated as 1.7x organic carbon
[2]Calcium carbonate calculated as 8.33x mineral carbon.
[3]Toluene-soluble sulfur.
[4]Alkaline-soluble humic substances sum of humic and fulvic fractions reported on ash-free basis.
[5]D = Element detected, but below limit of determination.
[6]– = Element not detected.

MERCURY IN THE ENVIRONS OF THE NORTH SLOPE OF ALASKA

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Acknowledgments

This work was supported by the office of Naval Research under grant NR 083-290.

The marine sediments were kindly provided by Peter Barnes and his colleagues of the U.S. Geological Survey, Menlo Park, California.

We thank the U.S. Coast Guard for providing the Cutter Glacier in the WEBSEC 72-73 cruises. Thanks are accorded Gary Hufford, the coordinator of these cruises, and Gregory Adam, Richard Bowman, William Gale, John Krezoski, Bruce Rutland, Alex Watt, and Dan Wolfe. Coast Guard marine science technicians who contributed importantly in sample collections.

By means of logistic support provided by the Naval Arctic Research Laboratory, Barrow, Alaska, the snows and certain river waters were gathered and we especially thank Richard Dickerson and James Aikins for their assistance in this regard.

Abstract

The analysis of Greenland ice suggests that the flux of mercury from the continents to the atmosphere has increased in recent times, perhaps partly as a result of the many of man's activities that effect an alteration of terrestrial surfaces. Upon the exposure of fresh crustal matter, the natural outgassing of mercury vapor from the earth's surface could be enhanced.

Accordingly, mercury was measured in a variety of environmental materials gathered from the North Slope of Alaska to provide background data prior to the anticipated increase of activity in this environment. The materials were collected during the U.S. Coast Guard WEBSEC 72-73 cruises as well as through the facilities provided by Naval Arctic Research Laboratory in the spring of 1973.

The method of measurement depended upon radioactivation of mercury with neutrons and the subsequent quantification of characteristic gamma radiations after radio-chemical purification.

Mercury concentrations in seawater at several locations in the vicinity of 151°W, 71°N averaged 20 parts per trillion. The waters from all stations east of this location showed a significantly smaller concentration. This difference may relate to penetration of Bering-Chukchi Sea water into the southern Beaufort Sea to 151°W. Marine sediments on the shelf and slope between 143°W and 153°W contained about 100 parts per billion mercury, except for those on the continental shelf between Barter Island and the Canning River, where the concentration was less than half this value. These results are consistent with sediment input from the respective rivers when their mercury content and mineralogy are considered. The mercury content of river waters was 18 ppt and in reasonable agreement with the average of snow samples (13 ppt). The burden of mercury in plankton was 37 ppb.

INTRODUCTION

Data derived from the analysis of Greenland ice suggests that the flux of mercury from the continents to the atmosphere has increased in recent times as a result of input by society (Weiss, et al., 1971). In addition to the obvious sources of mercury, it was further suggested that a fraction of the added quantity may be introduced through activities that result in alteration of terrestrial surfaces, thereby enhancing the natural outgassing of mercury vapor from the earth's crust.

With the anticipated intensification of human activity in the North Slope area, it was considered desirable to acquire baseline data. This report describes the concentration of mercury that was determined in plankton, snow, and in water and sediments from several rivers and the southern Beaufort Sea.

METHOD

Sample Collections. The plankton, and ocean sediments were collected on the US Coast Guard WEBSEC-72 Cruise during August 1972, while river sediments and river and ocean water were gathered in July-August 1973 on WEBSEC-73. By means of facilities provided by the Naval Arctic Research Laboratory (NARL), the snows were collected in mid-March 1973.

The accumulation of plankton was by standard oceanographic procedure in a vertical tow at 71° 12.0′ N, 149° 31.8′ W from a depth of 180 meters. The sample together with transfer distilled water was frozen until shortly before preparation for analysis.

Seawater samples were obtained from the southern Beaufort Sea between 146°-151°W longitude in 8-liter Niskin bottles by standard hydrocasting procedures. Aliquots were drawn into storage containers within 15 minutes after the collection.

Samples of river water were taken from the Umiat and Gubic regions of the Colville River and from 25 miles upstream on the Sagavanirktok River. The sample was collected about 6 in. from the surface after wading into the river to a depth of 2.5 ft.

Water samples were stored in polyethylene containers that previously had been soaked for 16 hours in concentrated nitric acid. The containers were rinsed three times with sample and then nearly filled. Immediately, 10 ml of 16 N nitric acid were added and the sample was stored for analysis.

Sagavanirktok and Colville River sediments were obtained 25 miles upstream at a distance of several feet from the shoreline. The marine sediments were acquired with a grab sampler. The sediments were transferred to polyethylene storage bags with a plastic utensil, and the samples were frozen as rapidly as possible after collection.

At distances of 30 to 135 miles south of Barrow, and in 15-mile increments, the samples of snow were acquired. When these locations were reached by plane, the engine was cut. After a 10-minute wait and at a distance of about 50 meters upwind from the plane, several inches of snow were removed and discarded. The underlying deposit was transferred with a clean plastic scoop to a polyethylene bag, which was stored in a thermally insulated box during transit. Upon return to NARL, the sample was melted at indoor temperature in 3-liter polyethylene containers previously leached with nitric acid as described above and rinsed five times with double-distilled water. These containers received 30 ml of concentrated nitric acid prior to melting.

Mercury Analysis. The mercury analyses were performed by a modification of a neutron activation analysis procedure previously described (Weiss and Crozier, 1972). The changes were introduced to provide for radiochemical purity at an earlier time after the irradiation; accordingly the sensitivity was appreciably enhanced.

Sample Preparation. Mercury was isolated from snow, river, and seawater samples by coprecipitation with copper. To 1 liter of sample was added 1 mg of 99.999% copper as nitrate. Reagent-grade hydrogen sulfide gas, after passing through a millipore membrane filter, was bubbled through the solution for 30 seconds. The resultant precipitate was collected by filtration. (This, and subsequent filtrations involved passage of the solution through millipore membrane filters of 0.45μ pore size). After filtration, the walls of the sample container were washed with 10 ml of concentrated nitric acid and this wash together with the copper sulfide placed in a polyethylene irradiation vial.

About 2 to 3 grams of sediment in the frozen state and 1 gram of thawed plankton, blotted with absorbent paper, were transferred to irradiation vials and weighed. Three ml of concentrated nitric acid were added to these samples prior to irradiation. A section of frozen sediment that was in juxtaposition to the sample was chipped off and its water content was determined by drying at 110°C for 1 hour.

Comparator and Nitric Acid Blanks. The comparator consisted of 10 μg of mercury as the nitrate in 10 ml of concentrated nitric acid. The nitric acid blank comprised three irradiation vials filled with 14 ml of concentrated nitric acid.

Irradiation. Samples, comparators, and blanks were irradiated for 1 hour in a flux of 1.8×10^{12} neutrons cm^{-2} sec^{-1} in a sample container that rotated at 1 rpm about the core of the Mark I TRIGA Reactor at Gulf Energy and Environment Services, San Diego, California. The irradiations occurred during the period 3 to 4 pm. The following morning samples were processed to obtain radiochemical purity.

Radiochemical Purification. Sediments and plankton were transferred to flasks that finally contained 1 ml concentrated phosphoric acid, 1 ml of mercury carrier (10 mg mercury as nitrate), 15 ml of 7 molar sulfuric acid, and 10 ml of concentrated nitric acid. The flask was attached to an apparatus described by Sjøstrand (1964) and distilled until fumes of sulfur trioxide appeared. The condensed acid was re-admitted to the flask and the distillation was repeated until sediments were white and the plankton digest was colorless.

Sediment and plankton were prepared further for radiochemical purification by addition of 25 ml of concentrated ammonium hyroxide to the digest, and the mixture was filtered. If at this stage pebbles were detected in the residual sediment, they were removed and the sample was corrected for their weight.

Ten mg of mercury carrier were added to water samples and the nitric acid blanks. The nitric acid blank was reduced in volume to about 10 ml. Water samples and blanks both received 9 ml of concentrated ammonium hydroxide and 10 mg each of potassium and sodium chloride. (The quantities of chlorides were also added prior to the succeeding precipitations.)

From this stage, with one exception noted later, all samples were treated similarly. To the filtrate were added 2.5 ml of freshly prepared stannous chloride. Mercury metal that precipitated was collected by centrifugation. The precipitate was dissolved in 5 ml aqua regia, 5 mg of copper (as nitrate) were added, and the solution was filtered. The reduction of mercury to the metal was repeated and the solid collected by filtration. The precipitate was again dissolved with 5 ml aqua regia (1 to 2 drops of concentrated phosphoric acid was added to the water samples), and the solution was neutralized with 5 ml of concentrated ammonium hydroxide. Hydrogen sulfide gas was passed through the pH-adjusted solution and the precipitate was collected by filtration. The mercuric sulfide was of sufficient purity to permit immediate measurement.

The comparator was neutralized with 9 ml of concentrated ammonium hydroxide after the addition of mercury carrier, and the mercuric sulfide was precipitated and collected for measurement.

Carrier Yield Determination. The processed mercury samples as well as mercury carrier standards (10 mg mercury) were re-irradiated for 5 seconds. Through comparison of the activity level of the samples and standards, the carrier yield was computed and the counting rate in the original irradiation was corrected for this factor.

Measurement. The radioactive measurements were made with a sodium iodide detector coupled to a 400-channel pulse-height analyzer. The counts attributable to the 77-keV radiation of ^{197}Hg were integrated by the method of Covell (1959).

RESULTS AND DISCUSSION

The mercury content of the zooplankton sample was 37 parts per billion (ppb), a value which falls within the range of 6 to 47 for zooplankton that were collected 430 km southwest of San Diego (Williams and Weiss, 1973).

The analysis of snow samples appears in Table I. Their values ranged from 3.5 to 46.2 parts per trillion (ppt), with an average of 13 ppt. This average value is substantially less than that of

Table I.—Mercury in Snows South of Barrow

Distance From Barrow, miles	Hg Concentration, ppt
30	5.2
45	3.5
60	6.4
75	46.2
90	16.7
105	8.5
120	9.8
135	6.9

apparently unpolluted ice recovered from Camp Century (Weiss, et al., 1971) and the Dye-3 site (Weiss, Bertine, Koide and Goldberg, in preparation) in Greenland, where the average concentrations ranged from 50 to 60 ppt.

The mercury concentration of waters gathered 25 miles upstream on the Sagavanirktok River and the Umiat and Gubic sections of the Colville River ranged narrowly between 16.8 to 18.7 ppt. These values are not markedly different from the average concentration in snow. The disparity is attributable either to the error in average snow value derived from only eight numbers, whose range extends over an order of magnitude, or to inclusion of an incremental amount of mercury as the snows melt and pass over the terrain. The mercury content of the river waters is low as compared with the Danube and Volga Rivers, in which the concentrations measured are usually about 1 to 2 ppb (Aidin'yan and Belavskaya, 1963). On the other hand, river waters in relatively unpolluted areas usually measure between 10 to 50 ppt (Dall' Aglio, 1967).

The mercury content of Beaufort Sea water collected at various depths between 146°W and 151°W are shown in Table II. At one of these stations (151°08′W, 71° 23′N) waters were analyzed in duplicate, and the error shown represents the average diviation from the mean; thus the average error is about 10%.

Marked variations of mercury concentration in the vertical are apparent. These variations do not occur as a function of depth; rather, they are random. This variability may be associated with the combining of a large fraction of the element with the particulate phase.

Of further interest is the greater average concentration of mercury in the water recovered from stations occupied at 151°W compared with all stations to the east of this longitude. The temperature data (Hufford, personal communication) indicate that Chukchi and Bering Sea water had penetrated to precisely 151°W during WEBSEC-73. The difference in mercury concentrations may, therefore, reflect varying concentrations of this element between the eastern Beaufort Sea and Chukchi-Bering Sea water masses. We contemplate the measurement of other water secured west of 151°W on WEBSEC-73 to further examine this possibility.

By way of comparison, Beaufort Sea waters contain considerably smaller quantities of mercury than Antarctic waters, where concentrations approximate 100 ppt, but are not markedly different from those collected in a transect from San Diego to an area north of the Hawaiian Islands (Williams, Robertson, Chew and Weiss, in preparation). In fact many water masses e.g., English Channel (Burton and Leatherland, 1971), Gulf of California (Weiss, in preparation), and the eastern tropical Pacific Ocean (Weiss, et al., 1972), are not grossly different from the Beaufort Sea in their mercury concentration.

The mercury content of sediments from the Sagavanirktok and Colville Rivers was 111.5 to 119.1 ppb, respectively. Marine sediments collected on the shelf, slope, and in the basin between 143°W to 154°W, with the exception of an area on the shelf from 143°W to 146°W, averaged 100 ppb, and no discrete pattern was evident with respect to distance from the shore (Figure I). These values are reasonably consistent with the river sediments that drain into this general area. The concentration was only 40 ppb on the shelf between the Canning River and Barter Island. Sediment was not available from the Canning River; however, these lower concentrations probably reflect input from this river. That Canning River sediment is different from that derived, for example from the Colville River delta has already been established (Naidu, personal communication). The illite-to-smectite ratio in the Canning River sediment is three times greater than in the Colville. The exchange capacity of illite for a heavy metal such as mercury is considerably less

than smectite; therefore the difference in mineral composition between the rivers could easily account for the differences observed in the marine sediments with respect to mercury.

In summary, the concentration of mercury in plankton, snow, river and ocean water, and sediments has been determined. These values will serve as baseline by which comparisons may be made at some future date to determine the influence of man's activities upon the concentration of this element in the North Slope environment.

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Table II.– The concentration of mercury in southern Beaufort Sea waters.

151°16′W 71°11′N		151°04′W 71°16′N		151°08′W 71°23′N		150°10′W 70°51′N		140°10′W 70°12′N		148°10′W 70°56′N	
Depth, m	Hg Concentration, ng/ℓ	Depth, m	Hg Concentration, ng/ℓ	Depth, m	Hg Concentration, ng/ℓ	Depth, m	Hg Concentration, ng/ℓ	Depth, m	Hg Concentration, ng/ℓ	Depth, m	Hg Concentration, ng/ℓ
5	(57)	5	11	1	29±2	5	14	5	15	5	11
10	19	10	17	5	19±0	10	19	10	12	10	15
15	25	15	30	10	38±6	15	12	15	9	15	10
20	22	20	20	15	19±1	20	12			20	8
		30	15	20	14±0	Mean	14	Mean	12	30	9
		40	27	30	21±0					40	13
	Mean 22	50	15	40	15±1					Mean	11
	(31)	75	17	50	13±2						
		90	22	75	17±2						
				100	24±1						
			Mean 19	100	20±4						
				200	17±3						
				300	19±2						
				400	23±2						
					Mean 21						

Table II.–The concentration of mercury in southern Beaufort Sea waters (cont.)

148°09′W 71°09′N		147°33′W 70°39′N		147°30′W 70°57′N		147°10′W 70°42′N		146°30′W 70°57′N	
Depth, m	Hg Concentration, ng/ℓ	Depth, m	Hg Concentration, ng/ℓ	Depth, m	Hg Concentration, ng/ℓ	Depth, m	Hg Concentration, ng/ℓ	Depth, m	Hg Concentration, ng/ℓ
5	15	5	10	5	17	8	10	5	12
10	21	10	5	10	11	10	12	10	10
15	18	15	16	15	10	15	19	15	19
20	17	20	14	20	12	20	13	20	20
30	14	Mean	11	30	14	30	21	30	19
40	13			40	9				
50	9			50	7				
75	10			Mean	11	Mean	15	Mean	16
100	17								
200	34								
300	16								
Mean	17								

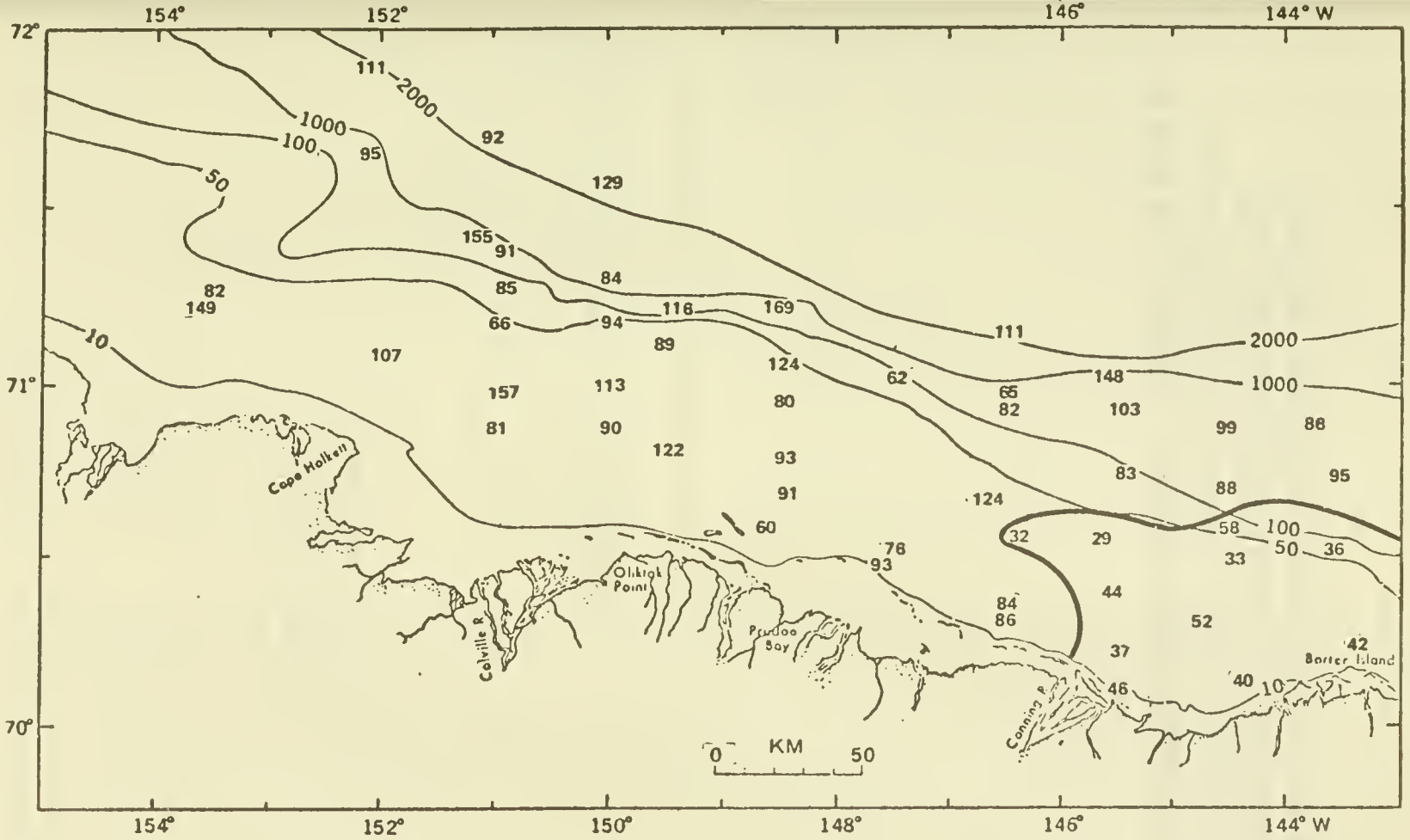

Figure 1.—Mercury in sediments (ng/g dry).

ASPECTS OF SIZE DISTRIBUTIONS, MINERALOGY AND GEOCHEMISTRY OF DELTAIC AND ADJACENT SHALLOW MARINE SEDIMENTS, NORTH ARCTIC ALASKA[1]

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INTRODUCTION

Lately it has been realized that there exists, for a number of reasons, a compelling need to preserve both the continental and marine environments in as unpolluted a state as possible. However, to detect pollution in an environment it is necessary to have in hand baseline ecological data of that environment in its pristine or unpolluted state. The foregoing statement has special relevance to the North Slope deltaic and shallow marine environments of North Alaska. Although these environments are now apparently free from any appreciable pollution, potential problems may arise in the future as a result of development in that area of newly discovered large petroleum reserves. Realizing this, several federal, state, and private agencies have undertaken to further our knowledge of north arctic Alaska. This report presents preliminary results of baseline studies on the size distributions, mineralogy, and chemistry of bottom sediments of the continental margin and the adjacent shallow marine regime of this region.

DESCRIPTION OF ENVIRONMENTS

The deltaic region of north arctic Alaska is one of the few transitional natural environments on earth of which we have very limited knowledge. The area under study extends from Harrison Bay in the west to Maguire Island in the east, and from the North Slope coast oceanward to approximately the 18 meter line (Figure 1).

The transitional environment between Cape Halkett and Canning River mouths (Figure 1) consists of a complex of several river estuaries, distributary channels, bays, lagoons, barriers, bars, coastal beaches and deltaic plain consisting of tundra. Several large rivers (e.g. Colville, Kuparuk, Sagavanirktok and Canning) have built deltas which coalesce laterally to form a complex of deltas. The most prominent of the deltas in this region is that of the Colville River, and it greatly influences sedimentation in the nearshore. As such it merits special mention.

The Colville River has a course of approximately 600 km, and has built a 560 km^2 delta at the mouth. Several distributaries break off from the main channel at the delta head, and as a result several lobate islands have formed in the far downstream end. Most of these islands in the estuary are elongated parallel to the distributary channels. All river channels of the North Slope are highly braided, presumably because of the great seasonal variations in sediment and water discharge. Arnborg et al. (1962) have calculated that the most striking feature of the arctic rivers is the great concentration of activity in a short period of time. For example, in 1962 43% of the annual discharge ($16 \times 10^9 m^3$) and 73% of the total inorganic suspended load (5.8×10^6 tons) were discharged from the Colville River during a three-week period around the spring breakup (Arnborg et al., 1962). The bulk of this sediment-laden fluvial discharge initially flows oceanward over sea ice situated off the river mouths, and settles on the ice as a deposit ranging from 2.5 to 24 centimeters in thickness. Finally this sediment finds its way to the bottom through drain holes in sea ice (Walker, 1972) and/or by melting of the ice. According to Reimnitz and Bruder (1972), most of this fluvial sediment outfall is deposited on the steeper slopes seaward of the 2 m depth contour off the Colville River mouth; this area represents the delta front.

Some detailed morphological and hydrographical attributes of the North Slope river deltas—especially that of Colville River—were recently presented by Walker and McCloy (1969), Lewellen (1972), Kinney et al. (1972), and Walker (1972), and; therefore, particulars of these attributes will not be enumerated here. However, it should be noted that the morphologies of the North Slope deltas do not exactly conform to any of the delta prototypes mentioned in the literature; the closest resemblance, at best, is probably to the arcuate delta type. All North Slope rivers are truly arctic rivers inasmuch as they arise, flow and discharge in arctic Alaska, which is charaterized by permafrost terrain. All these rivers are partly or wholly frozen almost eight months of the year.

The mean lunar tidal range in the north Alaskan arctic coast is comparatively very low, roughly .3 meters (Matthews, 1970). Kinney et al. (1972) have reported that in the lagoons and

near-shore during the summer surface currents may range from 0 to 37 cm/sec (0 to 0.75 knots). Dygas et al. (1972) while observing a good correlation of strength and directions of water currents and wind, concluded that in the Simpson Lagoon the bottom current velocity is on the order of 17.3 cm/sec. However, as a result of storm surge, sea level in the coastal area may vary as much as 1.5 meters within a short time (Matthews, 1970; Kinney et al., 1972). Although tidal flats are not extensive in the north coast of Alaska because of low tidal range, some low lying deltaic areas may often become waterlogged during the sea level rise resulting from storm surge.

Salinities of waters in the Colville Delta and adjacent continental margin region range from 10 ‰ to 65.9 ‰ (Kinney et al., 1972; Schell and Hall, 1972; Walker, 1972). Presumably, the usually high saline waters are formed as a result of great concentration of ions in water bodies entrapped between grounded ice; the ionic supply being from deionization of saline ice. Primary productivity in the lagoonal area is relatively low; most values ranged around 1 μg C-hr (Alexander and Billington, 1972).

The continental facies of the North Slope Deltas are dominated by the coastal beaches, Harrison Bay, Simpson Lagoon, the far offshore and nearshore barriers. The lagoon and Harrison Bay are shallow, having a depth range of 0.8 to 3.5 m. The barriers and bars are oriented roughly parrallel to the deltaic coastline, and locations of all barriers in the area of study are confined to the east of the Colville River confluence. The barrier surfaces consist predominantly of gravels. With the exception of the areas near river mouths, the coastal beach essentially has gravelly and sandy deposits, the size distributions of which have been described by Naidu et al. (1970) and Dygas et al. (1971). The open marine deltaic facies and the adjacent shelf surface are presently being, and/or have been modified, by ice gouging (Reimnitz et al., 1972), and some of the offshore bars seem to have originated by ice push. Comparative aerial photographic studies (Dygas et al., 1972) reveal large scale morphological changes in the Pingok and Thetis Islands over the past 20 years. The arctic deltaic environment under description differs from low-latitude deltas in several ways. The more notable differences are the absence of extensive sand dunes, flood plains, tidal flats, and mangrove swamps together with the common presence of coastal gravel deposits, a deltaic plain dominated by tundra, and subjection of the entire area to strong ice stress conditions for the major part of the year, as well as to thermal erosion.

MATERIALS AND METHODS

Results presented in this report are based on analyses of surface sediment samples that were collected either by a Van Veen/Shipek grab sampler or a short gravity corer. Most of the samples from the continental margin region were collected from the N.A.R.L. vessel R/V NATCHIK, and a few from a Boston Whaler. Samples from the deep water open marine evnironment were collected during the WEBSEC-71 cruise of the USCGC GLACIER. A few additional samples included in this report (BSS Series) comprise a part of the suite of short core sediments that were retrieved by the USCGC STATEN ISLAND in 1968.

Grain size distributions of sediments were analyzed by the combined methods of sieving and pipetting. Grain size statistical parameters were calculated using the formulae given by Folk and Ward (1958). Heavy minerals in three size grades of the sand fraction were separated in bromoform (Sp. Gr. 2.85).

Clay mineral analysis was accomplished by X-ray diffraction techniques. A Phillips Electronics Norelco X-ray diffractometer was employed, using Ni filtered Cu K_α radiation. The instrumental parameters used routinely, unless otherwise specified, were $2°2\theta$ per minute scan speed, time constant 2, with 1°-006 inch slits. For bulk clay mineralogy, analysis was routinely carried out on the $<2\mu$ e.s.d. (equivalent spherical diameter) size material of sediments, following the method described by Naidu et al. (1971). Although gross clay mineralogy is normally characterized fairly well by this analysis, often there are ambiguities left unresolved without more detailed investigations. Therefore, clay mineral analyses were also conducted on subfractions of $<2\mu$ e.s.d. particle size range for a

number of samples from the Colville River and the Harrison Bay. The sample preparation and analytical procedures for these subfractions were slightly different than for the $<2\mu$ fraction and, therefore, are elaborated upon as follows.

The bulk sample was wet-sieved with deionized water, using a 230-mesh (62 μ) stainless steel sieve. The resultant $<62\mu$ material was treated with H_2O_2, using the method described by Jackson (1956) in order to remove organic matter. The pH was monitored during this treatment (Douglas and Fiessinger, 1971). The most acidic value observed was 6.6, suggesting little likelihood of significant clay mineral modification resulting from this treatment.

The resultant sedimentary material was suspended in 1000 ml graduated cylinders, in deionized water, and all the $<2\mu$ e.s.d. size material was removed by repeated stirring, resuspending and differential settling of the coarser material ($>2\mu$ e.s.d.). The suspended $<2\mu$ material was removed by siphoning.

Less than 2μ material was subjected to further particle-size fractionation, using centrifugal sedimentation, following the methods described by Jackson (1956). The $<0.3\mu$ e.s.d. size fraction was removed first, followed successively by the $0.3 - <1.0\mu$ e.s.d. size fraction, and then the $1.0 - <2.0\mu$ e.s.d. size fraction.

For the resultant materials from station CR-5 (Figure 2), each of the particle-size fractions obtained was divided into two portions. One aliquot was reserved for analysis as described below, the second aliquot was first subjected to the treatment described by Jackson (1956), for the removal of free-iron-oxide from sediment.

For each particle-size fraction, for each sample location, seven specimens were prepared by placing aqueous suspensions on porous ceramic plates. By a vacuum applied to the underside of each plate, the suspended clay material was sedimented onto the surface of the plate in such a manner that the basal planes of the layer silicate minerals are predominantly aligned parallel to the surface of the plate.

Various further treatments were performed on the various plate mounts of each particle-size fraction of each sample, followed by X-ray diffraction analysis.

Specific Treatments and Clay Mineralogic Analysis

1. Saturation with ethylene glycol—This permits the detection of the presence of materials (e.g., smectites and some vermiculites, as well as mixed-layered phases containing either of these as component layers) into which molecules of glycol may associate themselves in interlayer structural sites. The resultant interplanar basal repeat distance for smectites is in the neighborhood of 17Å.

2. Saturation with KCl (1N)—This affords the opportunity for exchange of K^+ onto such appropriate interlayer structural sites as may exist in any of the mineral phases present. The present consensus regarding this phenomenon seems to be that materials variously described (often somewhat nebulously) as "stripped, weathered, degraded" illites or micas, "soil vermiculites," etc. will readily accept K^+ ions into interlayer structural sites formerly occupied by K^+ prior to the "degradation" process. This results in the "collapse" of the degraded structure, and is reflected in the X-ray diffraction analysis as a shift in basal spacings from somewhere >10Å to approximately the 10Å region. The term "illite" might be used to collectively designate materials of this sort, but other studies (e.g., Hower and Mowatt, 1966) have indicated that there are other aspects relative to this problem which are difficult to distinguish in working with polyphase assemblages such as the present study. In our present study illite has been adopted as a term of a more descriptive nature, for all "10Å material."

This further leads to the necessity here for a brief discussion of our handling of the matter of "interstratified," or "mixed-layer" materials. In view of the problems regarding the unraveling of diffraction effects from polycomponent assemblages, it seems best to merely generalize in a descriptive manner with respect to mixed-layer materials in our samples. The matter of mixed-layering has been dealt with recently by Hower (1967), Reynolds (1967), and Reynolds and Hower (1970) treating the problem of varying degrees of ordering within these materials, for simplified cases. The natural assemblages are undoubtedly more complex, and thus even less

amenable to clear understanding with our present methods. As pointed out by Mills and Zwarich (1972), the recognition and interpretation of interstratifications in clay mineral assemblages is often extremely difficult, and in the fine clay fractions attention must also be given to line-broadening effects on diffraction maxima resulting from very small particle sizes.

Smectitic materials are those which possess residual interlayer charges resulting from deviations from electrostatic neutrality within the "basic lattice" of the minerals such that equilibrium exchange of K^+ coordinated with water molecules into the interlayer sites is manifested by a basal spacing in the 12.5Å region by X-ray analysis, under our experimental conditions. In "degraded" micas, etc., this residual interlayer charge is somewhat higher (of a more negative character) such that K^+ ions enter the exchange sites without the water molecules, leading to the smaller (~10Å) interplanar distances observed. The other treatments described in this section are further examples of this approach.

3. Saturation with NaCl (1N)—This is done to ascertain the effects of the interaction between Na^+ ions, the various clay mineral phases, and the aqueous phase. The Na^+ ion as such is apparently not as stable in the interlayer sites of degraded micas as the larger K^+ ion, and its relationship to degraded phases is not clearly defined under our experimental conditions. However, smectitic materials effect an equilibrium with Na^+ and coordinated water molecules such that basal spacings in the 12.5Å region are observed by X-ray analysis.

4. Saturation with $MgCl_2$ (1N)—Although both vermiculitic and smectitic phases appear to adopt an equilibrium with Mg^{++} and water such that a basal spacing of about 14Å results, the smectitic materials will subsequently reequilibrate with ethylene glycol in such a manner that a basal spacing in the neighborhood of 17Å results, whereas vermiculites do not seem to show the same effect. "Degraded" chlorites, representing the chloritic analogs of vermiculites and "degraded" micas, also readily equilibrate with Mg^{++} ions and the aqueous phase, with a 14Å basal periodicity the result.

5. Saturation with $Ca(C_2H_3O_2)_2$ (1N)—Smectites, Ca^{++}, and water equilibrate in such a manner that a basal spacing of about 15Å results, whereas the behavior of vermiculties and degraded micas is somewhat indeterminate. Although this treatment was not overly useful in itself in delineating clay mineral species, it served as a necessary antecedent in effecting exchange of the same ion onto smectite phases in all samples prior to further heat treatments of these samples. The latter treatments did prove to be quite informative.

6. Saturation with filtered sea water—This treatment was performed to investigate the mutual equilibrium relationships among the major cations present in sea water, the aqueous phase, and the clay mineral phases, having analogous data from the other treatments described above for individual cations.

7. Saturation with ethylene glycol of each cation saturated sample, after X-ray diffraction analysis—to compare the effects of the various cation treatments, each specimen was saturated with ethylene glycol, and reanalyzed by X-ray diffraction. The resultant differences, for a given sample, in peak positions and intensities, were quite informative with respect to characterizing the mineral phases.

8. Heat treatment, one hour at 300°C—After X-ray analysis each calcium acetate treated specimen was heated in a muffle furnace for one hour at 300°C, and reanalyzed by X-ray diffraction. This treatment drives off the loosely bound interlayer water molecules from smectitic and vermiculitic materials, but has no appreciable effect on illitic, kaolinitic, or chloritic components. The resultant basal spacing for smectites and vermiculites coincides, in general, with that of illites and micas, in the neighborhood of 10Å. A useful comparison is possible here between the efficacy of KCl treatment and the 300°C treatment, for a given sample, in "collapsing" the hydrated "expandable" smectitic-vermiculitic layers present to this 10Å periodicity.

9. Heat treatments, one hour at 430°C followed by one hour at 550°C. Such step-wise heat treatment helps to differentiate kaolinite from chlorite (Brown, 1961; Grim, 1968). The same Ca^{++} saturated specimens previously heated at 300°C and 430°C were utilized for the 550°C heat treatment.

10. Slow-scanning, 20° to 28° 2θ—This was undertaken to resolve the presence or absence of kaolinite and chlorite (Biscaye, 1964, p. 1282). For this treatment KCl saturated specimens were considered.

11. HCl treatment—Aliquots of each particle size from samples KR1 and CR7 were subjected to treatment with 1N HCl at 80°C for 24 hours, and then analyzed by X-ray diffraction, using "slow-scanning" procedure. This method afforded the verification of the presence or absence of chlorite and kaolinite in the clays (Biscaye, 1964, p. 1284).

Pierce and Siegel (1969) have discussed at length the problems encountered with respect to attempts at quantifying clay mineral analyses. For samples under detailed study, we determined following the suggestion of Pierce and Siegel (1969) the areas of various diffraction peaks of interest, and tabulated these as our basic data.* We have also calculated various ratios of peak areas of interest, and used these in attempting to elucidate clay mineral relationships. However, to compare our gross clay mineral data (in the $<2\mu$ e.s.d. size) with those of other areas of the world we have used the method of attempting to quantify clay mineral analysis given by Biscaye (1965).

Total Fe, Mn, Ca, Mg, K, Na, Li, Rb, Cu, and Co were anlayzed by atomic absorption spectrometry, using a Perkin-Elmer, Model 303 unit. Sample preparation and analytical procedure were similar to those described by Naidu and Hood (1972). Accuracy of the elemental analysis was checked by analyzing U.S.G.S. standard rocks G-2 and AGV-1, and comparing the results with those compiled by Flanagan (1969). The precision in the major elemental analysis was better than ± 4%, and for Cu and Co it was about ± 12%. Organic carbon was determined in a Beckman disperse-beam infrared analyzer, following the analytical steps outlined by Loder (1971). Precision and accuracy of the organic carbon analysis are better than ± 5% and 11%, respectively. Carbonate in sediments was analyzed by the rapid gasometric method (Hülsemann, 1966).

*Basic data obtainable from the authors upon request.

RESULTS

Textural Analysis

The gravel, sand, silt, and clay percentages of the sediments are presented in Table 1. The majority of the sediments is either sands, silty-sands or, have equal proportions of sand, silt, and clay. There are only a few samples that have more than 1% gravel; the weight percentages of gravel in samples AJT22, AJT29 and KR1 are 3.84, 24.1 and 12.7, respectively. No marked vertical variations in the lithology were observed in short (0.3 to 0.8 meter) cores.

The proportions of gravel-sand, silt, and clay in the sediments of the continental margin under study are plotted in a triangular diagram (Figure 3), and similar plots of sediments collected from various environments of the Beaufort Sea are also illustrated for comparison. No significant difference in the distribution of the plots is apparent for the continental margin and the Beaufort Sea shelf sediments. However, comparison of the size analysis data in Table 1 and that presented by Burrell et al. (1970) distinctly shows that on the basis of gravel contents offshore deltaic and nondeltaic shelf sediments have different lithologies. The deltaic sediments, as mentioned earlier, rarely have gravels, whereas 72% of the shelf sediments of the Beaufort Sea do contain gravels.

Grain-size statistical parameters included in Table 1 show that sediments of Harrison Bay, Simpson Lagoon and the adjacent shallow marine environment have similar size distributions.

The relationships between Phi Mean Size (M_z) and Sorting (σ_I), and M_z and Skewness (Sk_I) of sediments are illustrated in the form of scatterplots (Figures 4 and 5). In these figures plots of the far offshore sediments of the Beaufort Sea are also included for comparison. There are definite clusterings of plots for the different environments, although some overlapping of field of the plots for the deltaic, nondeltaic shelf (<64m) and extrashelf (<64m) sediments is evident. The trends of the plots for all sediments except those of the Colville River show that there is a broad sinusoidal relationship between Phi Mean Size and Sorting (Figure 4). However, no trend is apparent between Phi Mean Size and Skewness values of sediments for individual environments,

although a fair negative correlation can be discerned between these parameters when sediments of all environments are considered together

Heavy Mineral Analysis

There are no unusually high concentrations of heavy minerals in any of the sand sizes (Table 2). In fact, the contents of heavy minerals are quite low. Relatively higher percentages of heavy minerals are generally observed in progressively finer size fractions of any one sand sample.

Clay Mineral Analysis

The weighted peak area percents (after Biscaye, 1965) of clay minerals in the $<2\mu$ e.s.d. size of the deltaic sediments of north arctic Alaska are presented, together with ratios of these percents, in Table 3. The percentages are classed according to depositional environments. Some lateral variations in clay mineral assemblages and ratios are apparent. In fact, a line of demarcation between two clay mineral facies can be drawn somewhat arbitrarily from Oliktok Point and extending northward perpendicular to the coast (Figure 1). To the west of this line sediments are relatively richer in smectite and kaolinite, whereas east of the line relatively higher amounts of illite are encountered. This fact is well exemplified by the presence of higher illite/smectite and illite/kaolinite ratios east of Oliktok Point (Table 3). No progressive downstream changes have been observed in clay mineral assemblages in the $<2\mu$ e.s.d. size over the last 161-km length of the Colville River (Figure 6). The clay mineral assemblages of samples CR4 and CR5 are unusually rich in smectite. It may be noted that at the points where these two samples were collected (Figure 1 and 2) two tributaries—Ingaluat Creek and Kogosukruk River respectively—flow into the Colville River. Sample 8, which was collected at the point of confluence of the Itkillik River tributary with the Colville River (Figure 1 and 2), has a great paucity of smectite and notably higher chlorite and kaolinite (Table 3). Typical X-ray diffraction traces of non-glycolated, $<2\mu$ e.s.d. sizes of Colville River clays, and to a lesser degree the nearshore deltaic clays as well, show a broad shoulder on the low angle side of the illite peak (Naidu, 1974). The presence of this shoulder suggests that the illite in these samples is associated with some other clay mineral components as mixed-layer phases. Our detailed clay mineral studies indicate the presence of mixed-layered illitic materials with associated interlayers of chlorite and/or smectite components, as well as the possible occurrence of degraded illite and/or chlorite in these sediments.

Chemical Analysis

Results of chemical analysis of the deltaic sediments of north arctic Alaska are presented in Table 4. For the purpose of comparison, the average elemental abundances of the deltaic sediments and those of the nondeltaic shelf and extrashelf of the Beaufort Sea (after Naidu and Hood, 1972) are included in Table 5.

Organic carbon contents in the deltaic sediments of north arctic Alaska are significantly lower than those observed in tropical deltaic sediments (Trask, 1939; Naidu, 1966). It is observed that there is a progressive seaward increase in organic carbon and a decrease in carbonate contents of sediments from the delta to the extrashelf through the shelf (Table 5). If fact, there is a great enrichment of carbonate and Ca in the deltaic sediments under study.

When compared to sediments of the marine facies of tropical deltas (Clarke and Washington, 1924; Hirst, 1962a, 1962b; and Naidu, 1968), the concentrations of Fe, Mn, and K are significantly lower and those of Ca, Mg, Na, Co, and Cu are higher in the deltaic sediments of north arctic Alaska (Table 5). However, in the far offshore nondeltaic shelf and extrashelf sediments the relative concentrations of all elements except Ca and Co are significantly higher than those observed in the north arctic Alaskan deltas (Table 5).

Within the delta, the order of average carbonate abundance in the various environments is as follows: lagoon (12.06%) > open marine (7.48%) > Harrison Bay (4.12%). On an average the contents of organic carbon are similar in the Bay (0.77%) and lagoon (0.79%) sediments, but sediments of the open marine deltaic facies have relatively lower organic carbon (0.58%).

DISCUSSION

Sediment Transport and Deposition

Spatial variations in gross texture and grain size parameters of sediments are powerful tools to a sedimentologist in the inference of the sediment source, direction of transport, and deposition, as well as in deducing the physical competency and fluctuation of sedimentation over a depositional area. Research on the deltaic sediments of north arctic Alaska is incomplete and, therefore, some of the following conclusions should be considered tentative.

An interesting observation in the north arctic delta under study is that the sediments of the lagoon, bay and adjacent shallow marine facies (Table 1) lack gravel-sized materials, or, at most contain only insignificant amounts. A similar observation was made by Tucker (1972). He analyzed some 100 sediments from the Simpson Lagoon and found a significant amount of gravel only in about 6 samples, and most of these samples were located near the gravelly coastal or barrier beaches. This paucity of gravel in the deltaic sediments is contrary to expectation, because in the barriers and coastal beaches there is a ready source of gravel. It was expected that the shore fast ice of these areas during spring breakup would pick up gravels, ice raft them offshore, and deposit most of these gravels in the lagoon and shallow marine facies of the delta subsequent to melting of the ice. The aforementioned dearth of gravel in the lagoon, bay and adjacent shallow marine area may be attributed to one or a combination of the following factors. (i) Contemporary tansport of gravel from the coastal and barrier beaches to the lagoon, bay and open marine environments of the delta, by ice-rafting and/or currents may be insignificant. (ii) The rate and amount of sand, silt, and clay deposition in the deltaic area may be relatively much higher than that of gravel and, therefore, the amount of gravel would be quantitatively greatly "diluted." (iii) There is a possibility of error arising from the sample collection and analytical methods used; generally about 0.5 kg of a sediment sample was collected from each location, and from this about 100 gm were taken for size analysis. To consistently detect and measure small amounts of gravel, it might well be deemed necessary to take and utilize larger amounts of sample materials.

Comparison of the size analysis data in Table 1 and that presented by Burrell et al. (1970) and Naidu (1973) clearly shows that, on the basis of gravel contents offshore the deltaic and the contiguous nondeltaic shelf sediments of north arctic Alaska have different lithologies. Unlike the deltaic deposits, the shelf sediments frequently (72% of the samples) do have gravels. These lithological differences naturally lead to the question of origin of the gravel on the nondeltaic shelf, which has been discussed at length by Naidu (1973). It is concluded that the bulk of the exposed shelf gravel is a relict sediment. The relict origin for most of the gravel on the shelf is primarily ascribed on the basis of the following premises. (i) Observations to date show that contemporary transport of gravel by ice-rafting to the Beaufort Sea shelf is insignificant (Barnes, 1972; Reimnitz, 1972; and Naidu, 1973). (ii) There is no coarse to fine sediment gradation from the coast to the outer shelf. This fact may be considered, as suggested by Emery (1968), and Swift et al. (1971), as well as by several others, a reliable criterion in establishing the relict nature of marine sediments. (iii) The shelf gravel appears to be in disequilibrium with present hydrodynamic conditions. Although no long-term data on water currents is available, good reasons exist to believe that at present there are no bottom currents of sufficient strength to transport gravel on the shelf. This is inferred indirectly from the presence of ferrimanganic coatings and of growths of encrusting Bryozoa and tube-forming polychaetous annelids only on the gravel surfaces facing the sediment top. Naidu (1973) has interpreted, based on sediment interstitial water studies, that the ferrimanganic coatings are contemporary precipitates. If at present there were strong currents on the shelf to transport these gravels intermittently, it would be expected that the ferrimanganic and biogenic encrustations would not be restricted solely to the gravel tops. The lack of strong currents at the present time is also substantiated by heavy mineral studies, results of which will be discussed in detail later in this report.

The processes by which the shelf gravels were transported and deposited in the past remains a

matter of speculation. Several possible origins—fluvioglacial, glacial, ice-rafting or residual—may be suggested. There is also the possibility that these gravels were laid down under high energy conditions, similar to those prevalent in many littoral environments. On the basis of available data (Coulter et al., 1965; and Hopkins, 1967) it is most improbable that, during the height of the last two major glaciations (Illinoian and Wisconsin), the continental glacial advances extended into and beyond the northern coastal province of Alaska. As such, a glacial and/or fluvioglacial origin for the shelf gravel seems unlikely. No rock outcrop on the present shelf has ever been reported and, therefore, any possibility that the gravel is a contemporary marine residual deposit is ruled out. Earlier it was observed that there is an absence of size-density relationship in the heavy mineral distributions in the sand-sized particles of the Beaufort Sea shelf (Naidu and Sharma, 1972). It is concluded from this that these sands were patently not deposited, either now or in the past, under high energy conditions, and most likely similar depositional conditions prevailed when the gravel associated with these sands was laid down.

By a process of elimination, it is surmised that the bulk of the gravel on the shelf of the Beaufort Sea is an ice-rafted paleo deposit. Substantiating this conclusion McCulloch (1967) has stated that some gravels on the edge of the northern coastal plain of Alaska were transported by ice-rafting during the mid-Wisconsin (Woronzofian) transgression, about 25,300 ± 2,300 years ago. It is suggestive that these ice-rafted gravels together with those on the shelf, and inferred as paleo deposit, apparently did not originate either in the Brooks Range or in other bedrock of northern Alaska. This conclusion is based on inferred sea-level position (McCulloch, 1967, p. 93 and p. 109), and the extent of the last two glaciations in the region (Coulter et al., 1965; and Hopkins, 1967), as well as from the exotic lithology of the Woronzofian gravels of north arctic coastal Alaska (MacCarthy, 1958; Black, 1964). Most probably these gravels were deposited by icebergs similar to the present-day "ice islands" that have originated from ice shelves of Ellesmere Islands in Canada (Hopkins, 1967, p. 81). Our preliminary mineralogic and petrographic studies of 56 specimens of gravel fragments of the Beaufort Sea shelf, together with several hundred samples of bedrock materials from the Brooks Range, seem to further substantiate this concept, although we do plan to pursue further work along these lines.

It is concluded that most of the paleo gravel has remained exposed on the middle and outer shelf regions, and has not been blanketed by modern deposits, presumably because of relatively low rates of subsequent sedimentation of sand and mud.

The present study has shown that no single environment has characteristic sediment sorting, skewness or kurtosis values (Table 1). As such, grain-size parameters should be considered with great caution in attempted interpretation of depositional environments of high latitude paleodeltaic sediments. Mean size of sediments seems to be the only size parameter that is different for the various environments (Table 1), and presumably this is determined by the varying contents of gravel and sand. Scatterplot diagrams of various grain size parameters (Figures 4 and 5), however, do appear to have a potential use in paleogeographic studies. The trends of plots in Figure 4 suggest that, except in the fluvial channel of the Colville River, the sorting of sediments in each environment is a function of the Phi Mean Size. In both the scatter-plot diagrams some overlapping of field of the plots for deltaic, nondeltaic shelf (<64m), and extrashelf (>64m) sediments is discerned. This may be explained on the basis that some sediments perhaps somewhat arbitrarily classed under a certain environment in actuality do not belong to that environment. The other possibility could be that such plots represent sediments that were deposited at the transitional zone between discrete environments.

Heavy Mineral Studies

The low concentrations of heavy minerals in the deltaic sediments under investigation (Table 2) may be related to: (i) low concentrations of heavy minerals in Colville River sands (Dygas et al., 1972), which presumably are an important primary source of the deltaic sands, and/or (ii) lack of prolonged hydraulic conditions sufficient

to concentrate heavy minerals in the sand fraction. Except during infrequent storms the continental margin and shallow marine environments of north arctic Alaska are essentially low energy depositional areas, and as such it is believed that sands of these regions are not exposed to extended mineral sorting by hydraulic action.

The relatively higher percentages of heavy minerals that are observed in successively finer sand size grades in almost any one of the sediments (Table 2) show that heavy mineral distributions in the present deltaic environment conform to the hydraulic equivalent concept (Rubey, 1933) and to the size-density relationships that usually exist in water-laid sands (Rittenhouse, 1943).

Observations made on the heavy mineral distributions in the offshore deltaic sediments (Table 2) are contrary to those made on the adjoining fluvial sediments (Dygas et al., 1972) and on far offshore nondeltaic shelf sediments of the Beaufort Sea (Naidu and Sharma, 1972), inasmuch as the size-density relationship does not exist in sediments from the latter two environments. Considering these differences, it would seem that in the deltaic marine area mineral sorting is brought about more effectively, presumably because of the prevalence there of stronger and prolonged hydraulic action. However, differences in hydraulic action can not be invoked to explain the observed differences between concentrations of heavy minerals in any one size of sand in the shelf and the delta. The fact that there are relatively higher contents of heavy minerals in sands of the shelf, in spite of the presumed lower energy conditions prevailing there, suggests that the bulk of the shelf sands have originated from somewhere else than the delta. We hope to clarify this suggestion by detailed heavy mineral studies of sands from the delta and the shelf.

The preceding conclusions seem to support the earlier contention that transportation of sand from the delta to the shelf by contemporary ice-rafting is insigificant. If ice transport, and associated in toto deposition of deltaic sands from the ice was important on the shelf, then it would be expected that both in the delta and on the shelf the total concentrations of heavy minerals and their distributional patterns in various sand sizes would be similar. This, as mentioned earlier, is not true.

Causes and Significance of Clay Mineral Variations

Results of our study do not show any clear cut progressive downstream changes in the bulk $<2\mu$ size clay mineral assemblages over the lower 161-km length of the Colville River (Figure 6, and Table 3). These observations run counter to those made in low-latitude estuaries by several investigators (Parham, 1966 for a review; and Naidu, 1968), who noted clay mineral changes with increased salinities of water progressively downstream. These systematic downstream variations in clay minerals have been generally attributed either to: (i) gradual reconstitution of one mineral to another through exchange/adsorption of ions, or (ii) continuous regeneration of degraded clay minerals by an increase in interlayer ion adsorption commensurate with increasing salinities, or (iii) physical sorting of various clay minerals because of differential settling of the various species induced by changing salinities of water. Thus it would seem that downstream variations in clay mineral assemblages in the Colville River are either not influenced by hydrographical factors or that there are other agents which tend to overcompensate the effects of these factors. We believe that clay mineral variations in the Colville River are largely influenced by local influxes of various detrital clay minerals, rather than to changes in the depositional environment. This is suggested by the abrupt increase in smectite and an attendant decrease in other clay minerals in samples 4 and 5 (Table 3; Figure 6). Likewise in sample 8 a notable increase in kaolinite and chlorite, and an abrupt drop in smectite concentration is observed. It is relevant to note that all these samples were gathered at or immediately downstream of the confluence points of the tributaries Ingaluat Creek, Kogosukruk River, and Itkillik River, repectively, with the Colville River. It is quite obvious from this relationship that the Kogosukruk River and the Ingaluat Creek flow through a smectite-rich terrain (presumably the Umiat Bentonite beds; Anderson and Reynolds, 1966), and that the Itkillik River drains a terrain—perhaps the greywackes of the Torok Formation—relatively enriched in kaolinite and chlorite and poor in smectite.

There is another possibility which merits mention in attempting to explain the apparent lack of

systematic downstream changes in clay mineral compositions in the Colville River. This is related to the presence of irregularly distributed and isolated pockets of highly saline waters (up to 40 ‰ salinity) in the lower Colville River channels (Schell and Hall, 1972). These pockets of water are formed during winters by sealing off the shallow portions of the river by the formation of bottom-fast ice and apparently have little or no connection with the saline water that is reported to penetrate upstream at this time (Arnborg et al., 1967). The possibility does exist that some of our samples, which were collected in the summer, within the 50-km Colville Estuary, were either deposited in or were in contact at sometime with such pockets of brine. In view of the assumption that salinities of these brines would vary haphazardly (Schell and Hall, 1972) it would be expected, as seen in the present case, that there would not be any systematic down-stream changes in clay mineral types.

The data in Table 3 show that in the $<2\mu$ size of Colville deltaic sediments there is a notable increase in the illite/smectite ratio and an attendant decrease in smectite/kaolinite ratio, from the Colville fluvial channels to the relatively more saline fluviomarine and open marine regions off the river mouth. These changes in clay mineral assemblages are at least in part presumably due to reconstitution in the more saline environment, through K^+ adsorption and/or cation exchange, of either degraded illites and/or mixed-layered illite-smectite derived from the nonsaline Colville River channel. This inference is supported by our detailed mineralogical studies on clay minerals within subfractions of the $<2\mu$ e.s.d. particle size, and by the results of laboratory investigations on $<2\mu$ size fresh and brackish water clays of the Colville River with sea water and at slightly above freezing temperatures (Naidu, 1972). Detailed clay mineralogical examination (refer to Appendix) shows that the Colville River clays are, in fact, highly reactive. However, the changes in clay minerals, especially the overall significant decrease in smectite from river to open sea, cannot be adequately explained solely on the basis of the processes mentioned above. Considering results of the detailed studies by Anderson and Reynolds (1966), as well as ours (refer to Appendix), it is difficult to envision that a smectite such as the Umiat Bentonite will undergo any significant reconstitution when passed on from fresh water fluvial channel to the open marine saline environment. Thus, some alternative mechanism must be invoked to explain the observed decrease in smectite in the fluviomarine and marine facies of the Colville Delta. At this stage of our knowledge we suspect that an appreciable amount of the smectite in the Colville River is somehow deposited at the mouth of the fluvial channels. Such a conclusion is supported by our detailed clay mineralogical studies on subfractions of clays within the $<2\mu$ e.s.d., and as well by the predominance of illite and chlorite with subordinate smectite in the suspensates collected at sample location CR8 (Figures 1 and 2). We are, however, not sure of the mechanism which brings about such a deposition of smectite. On the basis of experimental data gathered by Whitehouse and Jeffrey (1960) differential settling of smectite over illite, chlorite and kaolinite, induced by flocculation would seem an improbable factor. However, mineral sorting based purely on the primary nonflocculated size of detrital particles of smectite could be an important process in this context.

Data in Table 3 bear out that there are two major clay mineral zones in the shallow marine facies of the deltaic complex under study. Clays west of Oliktok Point have markedly lower illite/smectite and illite/kaolinite ratios than clays east of this point. These lateral variations in clay mineral types within contiguous areas are most probably attributable to differences in terrigenous clay mineral sources and their dispersal patterns, rather than to differences in depositional environments (Naidu and Mowatt, 1973). Sedimentation in the lagoonal area east of Oliktok Point is chiefly influenced by the sediment outfall of the Sagavanirktok and Kuparuk rivers, whereas sedimentation in Harrison Bay and the offshore open marine deltaic area west of Oliktok Point is largely affected by the Colville River discharge. The clay mineral compositions of these rivers are significantly different, inasmuch as the Colville River transports far more smectite and kaolinite than the Sagavanirktok River (Table 3). We feel that offshore dispersal of the clays discharged by the Colville River is chiefly

confined to the area west of Oliktok Point and much of it does not move into the Simpson Lagoon. The Sagavanirktok River sediment outfall does not seem to move far away from the river mouth. Dispersal patterns of the above clays are largely supported by the known mean current directions of waters over the area, which is towards the southwest (Kinney et al., 1972). Such a prevalence of currents would tend to push the Colville River flume away from the Simpson Lagoon area. A similar dispersal of the Sagavanirktok River clay is largely inhibited because Simpson Lagoon lies sheltered between the mainland coast and the barriers and thus is largely in the shadow area for the open marine southwest prevailing currents.

Our studies on clay mineral compositions of sediments from the continental margin and open marine environments of north arctic Alaska have not been completed. However, the preliminary results do indicate the potential value of this approach in the interpretations of paleogeography and paleocurrent of past depositional basins. The relevance of our clay mineral studies in environment and pollution studies has been discussed by Naidu (1972).

Sediment Geochemistry and Element Partition Patterns

The content of organic carbon in the deltaic and adjacent shallow marine sediments of north arctic Alaska is significantly lower (Table 4) than those observed in tropical deltaic sediments (Trask, 1939; Naidu, 1966). This may be due to the very low organic productivity in the Alaskan deltaic region as supported by phytoplankton productivity and ^{14}C primary productivity studies (Alexander and Billington, 1972), and low yearly supply of terrigenous detrital organic matter. It seems improbable that low organic carbon in our sediments is a result of relatively higher oxidative decomposition of organic matter in the region of our study. This conclusion is based on the fact that for most of the year the continental margin environment of north Alaska is covered with ice, and as such it would be expected that the environment overlying the sediments will be less ventilated and thus less oxygenated. Because of the general prevalence of low temperatures in the arctic, it is contended that the relatively low organic carbon in the arctic deltaic sediments is probably not due to higher organic decomposition by bacterial activity.

The progressive increase seaward of sediment organic carbon (Table 5) is contrary to the commonly observed pattern of organic carbon distributions in marine sediments (Trask, 1939, p. 445; Riley and Chester, 1971, p. 380). The generally observed seaward decrease in organic carbon of marine sediments has been attributed to: (i) seaward decrease of terrigenous organic supply, and (ii) seaward increase in organic decomposition (Riley and Chester, 1971, p. 294 and 380). However, on the basis of the above two factors obviously the observed seaward differences in organic carbon contents in the Beaufort Sea (Table 5) can not be explained. It is believed that in the present situation the regional differences in sediment organic carbon are determined by the variations in lithology. Such a conclusion is supported by the strong negative correlation observed between organic carbon and sand contents of the deltaic and nondeltaic sediments (Table 6; and Naidu and Hood, 1972). Presumably as a result of seaward decrease in sand (Table 1; Naidu and Hood, 1972) there is lesser seaward 'dilution' of sediment organic matter by sand size inorganic mineral particles, as well as concomitant decrease in oxidative decomposition of organic matter resulting from lower porosity of mud. From the correlations of organic carbon and sediment size grades, it is inferred that the bulk of the organic carbon in the deltaic sediments is associated with the silt fraction (Table 6) whereas in the nondeltaic marine sediments it is concentred in the clay fraction (Naidu and Hood, 1972). Possibly this is related to the differing hydrodynamical conditions of deposition, and the probable result of size fractionations of detrital organic particles as a function of distance from the shore.

As compared to the nondeltaic shelf and extrashelf sediments of the Beaufort Sea, there is notable enrichment of Ca and carbonate in the deltaic sediments (Table 5). Plausibly this is due to the presence of relatively higher contents of calcareous lithogenous and bioclastic components in the deltaic sediments. The bulk of the Ca appears to be tied up in the carbonate, as attested by a strong covariance between the two (Table 6;

and Naidu and Hood, 1972). However, there also seems to be some sorting of calcium carbonate based on size in the different environments. It is apparent (Table 6) that calcium carbonate in the deltaic sediments is concentrated in the clay fraction, whereas in the nondeltaic marine sediments most of it occurs in the sand fraction (Naidu and Hood, 1972).

Interelement correlations (Table 6) have been used by the authors in attempting to understand element partitions in these regions. The strong covariance between all alkali metals (Table 6) is to be expected because of their similar geochemical behavior. However, on the basis of the existing correlations (Table 6) it would seem that except for Na all the alkali metals are predominantly tied up with the clay fraction (plausibly in adsorbed/exchangeable sites of clay minerals), and with the organic matter. The association of alkali metals with organic matter is related to primary fixation of the metals by living organisms through metabolic activities; such a fixation is now well-known and appears to need no further elaboration here. It is apparent that the bulk of the Na has been distributed in some other sediment phase than the argillaceous or the biogenic fraction. The strong covariance of all alkali elements, particularly Na, with both Fe and Mn is difficult to explain unless the premise is made that the alkalies, Fe, and Mn have, at least in part, a common derivation in interstitial water. Sodium being a thallasophile element, a large amount of it can be accounted for in salts solidified from interstitial water, and to a smaller extent this is also applicable to other alkali metals.

The strong covariance of Fe and Mn suggests that a significant part of this element has either coprecipitated as ferrimanganic hydrate or is associated in a common sediment phase. Assuming that this is true, it is suggested that a part of this precipitate has originated from interstitial water. This does not seem untenable, in view of the fact that a few inches of the surface sediment have been analyzed in this study, and that post-depositional upward migration of soluble Fe and Mn, with oxidative precipitation of these elements at the sediment surface, would not be an unusual occurrence in this region. Naidu (1973) has shown that in fact such a precipitation of Fe and Mn is taking place on the adjoining shelf and extrashelf sediment surfaces of the Beaufort Sea. However, it is strongly suspected, from the data in Table 6, that the predominant part of the total Fe and Mn is tied up with organic matter, and in the silt size fraction of sediments—in heavy minerals or discrete ferrimanganic particles.

There are strong positive correlations between smectite, Fe and Mn (Table 6), but we are not sure of the significance of these correlations, because no significant covariance has been observed between Fe, Mn and the clay size fraction (of which latter smectite is of course a part). Assuming that the Fe-Mn-Smectite correlations are true, it follows that some of the Fe and Mn is associated with either adsorbed or exchangeable sites of smectite, and/or in basic lattice (octahedral, presumably) positions in smectites. The work of Anderson and Reynolds (1966) with the Umiat Bentonite does not suggest any appreciable nontronitic character of that material. Of course, this does not preclude the occurrence of nontronite clays elsewhere in the Colville River drainage area. However, we have observed in our detailed work (refer to Appendix for details) that the sediments at various sample locations along the Colville River contain varying amounts of ferruginous materials, much of it of an X-ray amorphous "limonitic" character, intimately associated with the clay minerals.

It seems quite probable that Mg, along with Ca, is related to the argillaceous and/or carbonate fraction of the deltaic sediments. Preliminary attempts made to understand the partition pattern of Co (Naidu, 1972) suggest that Co is being scavenged by ferric hydroxide.

The geochemistry of Cu in the deltaic sediments is not well understood, especially because of its positive correlations restricted to Ca, Mg, K, Li, Rb, illite, and carbonate fraction of sediments. A natural conclusion of such an association would be that Cu is chiefly bound with the carbonate phase, and possibly to a limited extent with the argillaceous fraction. Limestone and dolomite grains of terrigenous origin probably constitute the major portion of the carbonate material in these sediments. Copper is likely to be present in these grains as fine disseminations, probably of discrete sulphide phases. Prelimi-

nary data from a geochemical-mineralogical study of carbonate rocks in the Brooks Range, presently being undertaken by the Alaska State Geological Survey (Mowatt et al., in progress), indicate the common presence of copper associated with these rocks at levels slightly to moderately above reported averages for analogous rocks elsewhere. This coupled with the fact of known extensive, high-grade copper mineralization in parts of the Brooks Range (e.g. the Bornite-Ruby Creek deposits) in carbonate rocks seems to corroborate the suggested correlations we observe in the sediments of north arctic Alaska.

The possible argillaceous association of Cu is inferred indirectly from the strong covariances of Cu with K, Li, Rb and illite, and the presumption that illite is the predominant clay mineral in the clay fraction (Table 3). This further suggests that much of this "illite" actually represents detrital micaceous materials, and further that a considerable portion of this may well be vermiculitic and represent altered/weathered trioctahedral mica which would be anticipated to be somewhat higher in octahedral copper than dioctahedral micas. Illite resulting from the prograde reconstitutive sequence (diagenetic and anchimetamorphic) smectite → mixed-layer smectite/illite → illite, suggested by Hower and various coworkers (Velde and Hower, 1963; Hower and Mowatt, 1966; Maxwell and Hower, 1967), would not be expected to contain as much Cu in octahedral sites as illite representing "degraded" micas, due to the differing geologic environments associated with micas as opposed to smectites. Admittedly smectites associated with alteration zones proximal to hydrothermal Cu mineralization would be exceptions to the foregoing generalizations.

Interelement correlations have a potential use in understanding differences in elemental abundances between different environments (Table 5), provided the distributions of the elements are governed by similar geochemical rules, and involve the same sediment phases. At this stage of our study we can not conclusively say what the geochemical factors are that determine the differences observed between the chemistry of the deltaic, nondeltaic shelf, and the extrashelf sediments. It is strongly suspected that lower rates of sedimentation and higher salinities of interstitial waters in the offshore nondeltaic area contribute to the relatively higher alkali contents observed in that area as compared to the delta.

Considering all factors, it is concluded that the seaward increase in both Fe and Mn (Table 5) is most probably due to simultaneous seaward decrease in the solubility of Fe and Mn. It is also concluded that the differences observed in the Fe and Mn contents between the deltaic and nondeltaic shelf sediments are not due to possible differences in the rates and amounts of mobilization and precipitation of Fe and Mn from interstitial waters in the above two environments. This conclusion is arrived at after considering the factors that govern the mobilization and precipitation of elements from interstitial waters (Riley and Chester, 1971, p. 404-407). The factors which point to the insignificant role of interstitial waters in this context are the relatively higher contents of organic carbon and plausibly higher rates of sedimentation in the deltaic region, as compared to the nondeltaic area.

The above interpretations on element partition patterns are chiefly based on correlation coefficient calculations for the gross sediments, and thus we present them with some reservations. However, to better understand the geochemistry, and to predict the partition patterns of the elements with more confidence, it would be necessary to analyze elements in different sediment phases. The lithogenous (lattice-bound), nonlithogenous (adsorbed/exchangeable phases), and various biogenous and chemogenous components of the sediments would have to be analyzed. Our future plans call for such a detailed study.

Elemental concentrations cited in Table 4 and 5 should be useful as baseline data to detect any chemical pollution in the deltaic and marine environments of north arctic Alaska.

ACKNOWLEDGEMENTS

We wish to thank Joe A. Dygas for his help in analyzing the carbonate contents in sediments. The statistical analysis and the X-ray analysis were kindly conducted by Bob Tucker and Mrs. Namok C. Veach, respectively.

Icebreaker ship support was provided by the U.S. Coast Guard. The help of Dr. Peter Barnes

and Jim Trumbull of the U.S. Geological Survey, Joe Dygas, Bob Tucker and Terry Hall of the Institute of Marine Science, University of Alaska, and Tom Furgatsch, Dave Mountain and Officers and crew of the U.S.C.G.C. GLACIER and STATEN ISLAND, in the collection of samples is gratefully acknowledged.

This work was supported by the NOAA-Office of Sea Grant, Department of Commerce, (Contract 14-09-001-12599); as well by the Office of Marine Geology, U. S. Geological Survey (Contract 14-09-001-12559), and the Office of Research and Monitoring, U.S. Environmental Protection Agency (Contract R-8001124), Prudhoe Bay Environmental Subcommittee, and by the State of Alaska.

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Table 1.—Statistical grain size parameters of deltaic and shallow marine sediments, north arctic Alaska

Sample No.	Environment*	Water Depth (m)	Gravel %	Sand %	Silt %	Clay %	Median (Md)	Mean (Mz)	Sorting (σ_I)	Skewness (SK_I)	Kurtosis (K_G)
HB-1	HB	3.2		12.1	66.9	21.1	6.60	6.81	2.41	0.10	1.66
HB-2	HB	3.0		68.1	21.0	10.9	2.93	4.26	2.38	0.83	0.89
HB-3	HB	3.0		96.2	1.6	2.2	2.85	2.85	0.33	0.16	1.32
HB-4	HB	3.0		15.3	71.2	13.6	6.88	6.52	2.23	-0.10	0.86
HB-5	HB	3.0		95.9	2.8	1.3	3.00	3.02	0.39	0.15	1.24
HB-6	HB	2.8		6.1	80.1	13.8	5.52	5.88	2.25	0.51	2.12
HB-7	HB	2.3		14.9	78.0	7.1	4.38	5.43	1.83	0.76	1.14
AJT-31	HB	7.6		31.2	50.1	18.8	6.15	5.48	2.90	-0.20	0.72
AJT-32	HB	8.5		55.5	39.1	5.4	3.85	4.10	1.54	0.49	1.87
CT-14	HB		0.2	37.8	26.5	36.6	4.34	5.58	2.76	0.45	0.66
KR-1	LG	0.5	0.5	12.7	77.5	1.8	2.52	2.05	1.90	-0.42	1.78
AJT-1	LG	3.2		84.8	6.8	8.4	3.08	3.33	1.82	0.77	7.45
AJT-2	LG	2.5		8.9	68.3	22.8	5.95	6.67	2.89	0.47	1.54
AJT-3	LG	8.5		22.2	31.4	46.5	6.15	6.95	3.54	0.37	0.93
AJT-4	LG	11.3		70.5	9.8	19.7	3.25	3.77	2.39	0.73	3.31
AJT-6	LG	4.6		94.3	2.3	3.3	2.68	2.70	0.52	0.28	2.11
AJT-8	LG	6.7		55.4	28.2	16.5	3.68	4.82	3.23	0.66	1.39
AJT-10	LG	5.0		81.2	9.4	9.4	2.15	2.87	2.59	0.84	6.78
AJT-12	LG	5.2		31.5	51.8	16.7	4.50	5.87	3.05	0.75	1.28
AJT-13	LG	4.0		28.8	41.8	29.5	6.00	6.62	3.47	0.35	0.96
AJT-14	LG	4.9		17.3	59.5	23.2	4.98	6.23	3.08	0.66	1.28
AJT-15	LG	2.6		65.0	23.3	11.8	3.72	4.87	2.78	0.82	4.50
AJT-37	LG	2.1		58.0	31.5	10.5	2.97	4.21	2.25	0.56	1.01
AJT-38	LG	1.5		43.4	44.7	12.0	4.62	4.79	2.50	0.23	0.95
AJT-39	LG	2.1		23.0	68.8	8.2	4.38	4.76	1.88	0.43	1.54
AJT-33	OM	16.2		34.6	26.9	38.6	6.65	6.50	3.33	0.12	0.81
AJT-34	OM	18.0		59.3	20.2	20.5	3.15	4.79	3.43	0.85	0.62
AJT-35	OM	19.8	0.6	34.0	27.5	37.9	8.25	7.10	3.45	-0.24	0.76
AJT-36	OM	17.1	0.9	92.9	3.0	3.2	3.00	3.02	0.49	0.39	2.88
AJT-25	OM	18.3		50.7	26.2	23.1	3.75	4.10	4.60	0.10	0.81
AJT-27	OM	19.2		49.3	24.7	26.1	4.40	5.37	3.19	0.35	0.68
AJT-28	OM	18.0		49.3	34.6	16.1	4.02	4.74	2.95	0.34	0.98
AJT-29	OM	14.6	24.6	56.1	12.6	6.7	1.52	1.22	3.44	0.01	1.35
AJT-17	OM	4.6		7.1	45.4	47.5	7.72	8.12	3.16	0.20	1.05
AJT-19	OM	8.8		45.5	28.3	26.2	4.22	6.08	3.66	0.72	0.95
AJT-21	OM	16.8		85.7	4.9	9.4	2.58	2.68	1.99	0.46	6.21
AJT-22	OM	20.4	24.1	45.2	11.5	19.2	2.15	3.22	5.65	0.29	1.07
AJT-30	OM	7.6		76.7	19.7	3.6	2.22	2.72	1.80	0.58	1.37

*HB: Harrison Bay; LG: Lagoon and OM: Open Marine

Table 2.—Weight percentages of light and heavy minerals in the deltaic and shallow marine sediments, north arctic Alaska.

Sample Number	+60 mesh (0.75–2.0ϕ)		+120 mesh (2.0–3.0ϕ)		+230 mesh (3.0–4.0ϕ)	
	Light	Heavy	Light	Heavy	Light	Heavy
AJT-2	99.95	0.05	99.20	0.80	98.30	1.70
AJT-6	98.82	1.18	97.30	2.70	90.96	9.04
AJT-10	99.91	0.09	95.21	4.79	86.01	13.99
AJT-12	–	–	–	–	99.05	0.95
AJT-37	99.71	0.29	–	–	–	–
AJT-38	99.92	0.08	99.63	0.37	98.35	1.65
AJT-39	–	–	–	–	99.63	0.37
AJT-17	–	–	–	–	98.00	2.0
AJT-19	98.22	1.78	97.56	2.44	96.65	3.35
AJT-21	99.37	0.63	98.42	1.58	90.18	9.82
AJT-23	99.85	0.15	99.37	0.63	99.17	0.83
AJT-40	–	–	99.69	0.31	98.86	1.14
AJT-43	95.09	4.91	97.47	2.53	94.36	5.64
4-B	–	–	99.92	0.08	99.20	0.80
9-A	99.73	0.27	98.69	1.71	96.70	3.30
HB-1	–	–	97.94	2.06	98.54	1.46
HB-2	99.63	0.37	99.64	0.36	97.14	2.86
HB-3	–	–	98.90	1.10	95.20	4.80
HB-4	–	–	–	–	99.27	0.73
HB-5	–	–	99.91	0.09	73.50	26.50
HB-6	–	–	–	–	99.55	0.45
HB-7	–	–	–	–	99.59	0.41

Table 3.—Clay mineral compositions[1] of deltaic and shallow marine sediments, north arctic Alaska.

Sample Number	Smectite	Illite	Kaolinite	Chlorite	Kaolinite / Chlorite Ratios	Smectite / Chlorite Ratios	Illite / Smectite Ratios	Smectite / Kaolinite Ratios	Illite / Kaolinite Ratios	Illite / Chlorite Ratios	Environment*
CR1	9	61	9	21	0.4	0.4	7	1.0	7	3	F(171)
CR2	9	59	11	21	0.5	0.4	7	0.8	5	3	F(136)
CR3	17	51	11	21	0.5	0.8	3	1.5	5	2	F(120)
CR4	55	32	3	10	0.3	5.5	1	18.0	11	3	F(107)
CR5	44	38	5	13	0.4	3.4	1	8.8	8	3	F(91)
CR6	14	54	11	21	0.5	0.7	4	1.3	5	3	F(74)
CR7	15	53	10	22	0.6	0.7	4	1.5	5	2	F(58)
CR8	2	51	15	32	0.5	0.1	25	0.1	3	2	F(45)
CR9	13	47	14	26	0.5	0.5	4	0.9	3	2	F(35)
CR11	43	38	8	11	0.7	3.9	1	5.4	5	3	F(33)
CR12	53	29	7	11	0.6	4.8	1	7.6	4	3	F(28)
CR13	40	36	7	17	0.4	2.4	1	5.7	5	2	F(24)
CR14	31	43	6	20	0.3	1.6	1	5.2	7	2	F(20)
CR15	22	51	8	19	0.4	1.2	2	2.8	6	3	F(15)
CR16	31	49	7	14	0.5	2.2	2	4.4	7	4	F(9)
CRWC	14	56	10	20	0.5	0.7	4	1.4	6	3	F(8)
CR17	41	36	7	16	0.4	2.6	1	5.9	5	2	F(5)
CR18	30	49	6	15	0.4	2.0	2	5.0	8	3	F(0)
CR10	12	48	8	32	0.3	0.4	4	4.0	6	6	F(0)
12A	17	60	11	12	0.9	1.4	4	1.6	6	6	HB
4B	25	52	5	18	0.3	1.4	2	5.0	10	10	HB
HB1	22	52	7	19	0.4	1.2	2	3.1	7	7	HB
HB2	30	40	12	18	0.7	1.7	1	2.5	3	3	HB
HB3	19	54	7	19	0.4	1.2	3	2.7	8	3	HB
HB4	24	50	7	19	0.4	1.3	2	3.4	7	7	HB
HB5	14	61	7	17	0.4	0.9	4	1.9	8	4	HB

NOTE:* F: Fluvial Channel (figures in parenthesis indicate distance in km from Colville River mouth)
HB: Harrison Bay
LG: Lagoon
OM: Open Marine
Tr: Trace
Ab: Absent
1: Weighted peak area percents (after Biscaye, 1965)

Table 3.—Clay mineral compositions[1] of deltaic and shallow marine sediments, north arctic Alaska (cont.)

Sample Number	Smectite	Illite	Kaolinite	Chlorite	Kaolinite / Chlorite Ratios	Smectite / Chlorite Ratios	Illite / Smectite Ratios	Smectite / Kaolinite Ratios	Illite / Kaolinite Ratios	Illite / Chlorite Ratios	Environment*
HB6	29	46	6	19	0.3	1.5	2	4.8	8	2	HB
HB7	21	52	5	22	0.2	1.0	2	4.2	10	2	HB
AJT32	15	58	11	16	0.7	0.9	4	1.4	5	4	HB
AJT31	14	55	11	20	0.6	0.7	4	1.3	5	3	HB
KR1	Tr	78	8	14	0.6	...	>78	<0.1	10	6	LG
AJT30	16	58	9	17	0.5	0.9	4	1.8	6	3	HB
AJT33	8	61	15	16	0.9	0.5	8	0.5	4	4	HB
AJT1	Tr	69	13	18	0.7	...	>69	<0.1	5	4	LG
AJT2	1	71	7	21	0.3	0.1	71	0.1	10	3	LG
AJT3	2	49	12	37	0.3	0.1	24	0.2	4	1	LG
AJT4	2	69	11	18	0.6	0.1	35	0.2	6	4	LG
AJT6	1	68	13	18	0.7	0.1	68	<0.1	5	4	LG
AJT8	Tr	76	6	18	0.3	...	>76	<0.1	13	4	LG
AJT10	1	77	7	15	0.5	0.1	77	0.1	11	5	LG
AJT12	Ab	79	6	15	0.4	...	>79	...	13	5	LG
AJT13	Ab	80	9	11	0.8	...	>80	...	9	7	LG
AJT14	1	75	7	17	0.4	0.1	75	<0.1	11	4	LG
AJT15	Ab	85	4	11	0.4	...	>85	...	21	8	LG
AJT37	5	70	7	18	0.4	0.3	14	0.7	10	4	LG
AJT38	13	65	8	14	0.6	1.0	5	1.6	8	5	LG
AJT39	15	59	12	14	0.8	1.1	4	1.3	5	4	LG
AJT29	11	68	7	15	0.4	0.7	6	1.6	10	5	OM
AJT36	14	59	11	16	0.7	0.9	4	1.3	5	4	OM
AJT28	12	68	7	14	0.5	0.9	6	1.8	10	5	OM
BSS7	2	67	9	22	0.4	0.1	33	0.2	7	3	OM
AJT27	5	68	11	16	0.7	0.3	13	0.5	6	4	OM

NOTE:* F: Fluvial Channel (figures in parenthesis indicate distance in km from Colville River mouth)
HB: Harrison Bay
LG: Lagoon
OM: Open Marine
Tr: Trace
Ab: Absent
1: Weighted peak area percents (after Biscaye, 1965)

Table 3.–Clay mineral compositions[1] of deltaic and shallow marine sediments, north arctic Alaska (cont.)

Sample Number	Smectite	Illite	Kaolinite	Chlorite	Kaolinite / Chlorite Ratios	Smectite / Chlorite Ratios	Illite / Smectite Ratios	Smectite / Kaolinite Ratios	Illite / Kaolinite Ratios	Illite / Chlorite Ratios	Environment*
AJT34	8	60	14	18	0.8	0.4	8	0.6	4	3	OM
AJT35	2	60	11	27	0.4	0.1	30	0.2	6	2	OM
CT14	10	67	7	17	0.4	0.6	7	1.4	10	4	OM
BSS5	6	67	12	15	0.8	0.4	11	0.5	6	5	OM
BSS6	2	63	7	28	0.3	0.1	32	0.3	9	2	OM
BSS24	11	64	8	17	0.5	0.7	6	1.5	9	2	OM
GLA79	14	57	11	18	0.6	0.8	4	1.2	5	3	OM
GLA71	9	66	9	16	0.6	0.6	7	1.0	7	4	OM
BSS23	21	55	8	17	0.5	1.0	3	2.7	7	3	OM
BSS14	16	59	8	17	0.5	1.0	4	2.0	7	4	OM
BSS88	11	61	11	17	0.7	0.7	6	1.0	6	4	OM
GLA72	14	56	10	20	0.5	0.7	4	1.5	6	3	OM
BSS87	7	61	14	18	0.8	0.4	9	0.5	4	3	OM
BSS62	18	57	9	16	0.6	1.1	3	1.9	6	4	OM
BSS85	6	63	12	19	0.6	0.3	11	0.5	5	3	OM
BSS22	15	61	6	19	0.3	0.8	4	2.7	11	3	OM
GLA74	16	58	10	17	0.6	1.0	4	1.6	6	4	OM
BSS93	24	54	9	14	0.6	1.8	2	2.8	6	4	OM
BSS91	5	60	10	25	0.4	0.2	12	0.5	6	2	OM
AJT17	3	55	12	30	0.4	0.1	18	0.3	5	2	OM
AJT19	2	71	11	16	0.7	0.1	36	0.2	7	4	OM
AJT21	5	65	10	20	0.5	0.3	13	0.5	7	3	OM
AJT22	4	68	6	22	0.3	0.2	17	0.7	11	3	OM
AJT25	10	67	7	15	0.5	0.7	7	1.5	10	4	OM
AJT26	5	63	10	21	0.5	0.3	12	0.5	6	3	OM
AJT40	13	64	6	17	0.3	0.8	5	2.4	5	4	OM

NOTE:* F: Fluvial Channel (figures in parenthesis indicate distance in km from Colville River mouth)
HB: Harrison Bay
LG: Lagoon
OM: Open Marine
Tr: Trace
Ab: Absent
1: Weighted peak area percents (after Biscaye, 1965)

Table 3.—Clay mineral compositions[1] of deltaic and shallow marine sediments, north arctic Alaska (cont)

Sample Number	Smectite	Illite	Kaolinite	Chlorite	Kaolinite / Chlorite Ratios	Smectite / Chlorite Ratios	Illite / Smectite Ratios	Smectite / Kaolinite Ratios	Illite / Kaolinite Ratios	Illite / Chlorite Ratios	Environment*
AJT43	9	67	10	14	0.7	0.6	8	0.9	7	5	OM
GLA86	10	64	6	20	0.3	0.5	7	1.6	11	3	OM
GLA73	11	67	8	13	0.6	0.8	6	1.3	8	5	OM
GLA75	20	60	7	13	0.5	1.5	3	2.9	9	5	OM
GLA77	14	60	10	17	0.6	0.8	4	1.3	6	4	OM
APB68	5	69	9	17	0.6	0.2	14	0.5	7	4	OM
SAG.R	2	69	6	24	0.3	0.1	40	0.2	12	3	F

NOTE:* F: Fluvial Channel (figures in parenthesis indicate distance in km from Colville River mouth)
HB: Harrison Bay
LG: Lagoon
OM: Open Marine
Tr: Trace
Ab: Absent
1: Weighted peak area percents (after Biscaye, 1965)

Table 4.—Chemistry of deltaic and shallow marine sediments, north arctic Alaska.

Sample No.	Water Depth (m)	Gravel %	Sand %	Silt %	Clay %	Corg.	$CO_3^=$	Fe	Mn	Ca	Mg	K	Na	Li	Rb	Cu	Co	SMT	ILT	KLT	CLT
AJT-1	3.2		84.78	6.81	8.40	0.22	17.2	1.30	0.022	10.560	0.488	0.604	1.292	0.0018	0.0010	0.0034	0.0025	0.5	69	13	18
AJT-2	2.5		8.92	68.25	22.81	0.98	16.6	1.94	0.026	8.960	1.100	1.225	1.520	0.0033	0.0045	0.0010	0.0025	1	71	7	21
AJT-3	8.5		22.19	31.36	46.47	0.89	13.9	0.91	0.019	7.040	1.604	0.802	1.344	0.0015	0.0017	0.0005	0.0017	2	49	12	37
AJT-4	11.3		70.48	9.83	19.68	0.19	14.2	1.30	0.020	7.640	1.820	0.762	1.356	0.0015	0.0015	0.0020	0.0022	2	69	11	18
AJT-6	4.6		94.34	2.31	3.34	0.30	5.8	1.30	0.028	9.400	0.880	0.564	1.320	0.0013	0.0015	0.0040	0.0022	1	68	13	18
AJT-8	6.7		55.39	28.16	16.45	0.49	12.5	1.72	0.022	6.960	1.524	1.090	1.468	0.0023	0.0025	0.0010	0.0020	0.5	76	6	18
AJT-10	5.0		81.22	9.41	9.37	0.33	3.0	1.51	0.029	2.288	0.644	0.955	1.372	0.0015	0.0038	0.0020	0.0021	1	77	7	15
AJT-12	5.2		31.53	51.75	16.72	0.84	16.9	2.14	0.027	8.720	1.660	1.347	1.460	0.0033	0.0039	0.0145	0.0025	0	79	6	15
AJT-13	4.0		28.75	41.77	29.48	0.78	11.7	2.15	0.032	8.200	1.604	1.329	1.800	0.0032	0.0045	0.0073	0.0042	0	80	9	11
AJT-14	4.9		17.27	59.50	23.23	0.59	15.2	2.36	0.032	9.480	2.044	1.612	1.784	0.0036	0.0058	0.0055	0.0057	1	75	7	17
AJT-15	2.6		64.96	23.29	11.75	2.23	15.3	2.22	0.029	8.200	1.150	0.958	1.494	0.0028	0.0027	0.0067	0.0032	0	85	4	11
AJT-17	4.6		7.08	45.42	47.50	1.36	14.2	3.14	0.046	9.080	1.708	2.013	2.092	0.0048	0.0078	0.0075	0.0055	3	55	12	30
AJT-19	8.8		45.47	28.31	26.22	0.70	14.2	1.85	0.031	6.640		1.122	1.068	0.0028	0.0027	0.0010	0.0030	2	71	11	16
AJT-21	16.8		85.70	4.89	9.41	0.36	4.6	1.41	0.026	2.440	1.044	0.825	1.244	0.0019	0.0016	0.0020	0.0020	5	65	10	20
AJT-22	20.4	24.10	45.23	11.51	19.16	0.38	11.2	2.09	0.033	6.440	2.680	1.230	1.620	0.0023	0.0039	0.0047	0.0022	4	68	6	22
AJT-25	18.3		50.74	26.17	23.09	0.83	4.1	3.20	0.045	5.560	1.876	1.429	1.476	0.0038	0.0053	0.0040		10	67	7	15
AJT-26	17.7	0.15	98.53	0.86	0.46	0.09	4.5	0.99	0.015	1.912	1.000	0.519	1.296	0.0008	0.0027	0.0008		5	63	10	21
AJT-29	14.6	24.64	56.05	12.57	6.74	0.36	2.3	1.45	0.019	1.516	0.680	0.618	0.960	0.0018	0.0024	0.0015		11	68	7	15
AJT-30	7.6		76.68	19.74	3.58	0.42	7.5	1.54	0.022	5.600	0.784	0.658	1.008	0.0018	0.0022	0.0030		16	58	9	17
AJT-31	7.6		31.20	50.05	18.77	1.32	4.0	2.95	0.051	2.668	1.060	1.270	2.092	0.0035	0.0050	0.0032		14	55	11	20
AJT-32	8.5		55.52	39.06	5.41	0.19	5.7	1.42	0.017	5.520	0.884	0.555	0.968	0.0018	0.0016	0.0014		15	58	11	16
AJT-33	16.2		34.56	26.88	38.57	0.67	6.8	2.80	0.030	5.080	1.572	1.338	1.372	0.0038	0.0056	0.0025		8	61	15	16
AJT-35	19.8	0.60	33.99	27.50	37.92	0.61	4.2	3.10	0.042				0.976	0.0037	0.0042	0.0032		2	60	5	27
AJT-36	17.1	0.91	92.85	3.04	3.20	0.19	5.7	1.52	0.024				0.672	0.0016	0.0020	0.0013		14	59	11	16
AJT-37	2.1		57.98	31.53	10.49	1.22	8.1	2.10	0.029	5.840	0.980	0.924	1.292	0.0029	0.0039	0.0022		5	70	7	18
AJT-38	1.5		43.35	44.70	11.95	1.51	10.0	1.80	0.021	6.320	1.004	0.870	1.444	0.0026	0.0038	0.0025		13	65	8	14
AJT-39	2.1		22.96	68.81	8.24	0.53	8.5	2.80	0.032	2.100	1.120	1.068	1.120	0.0030	0.0043	0.0024		15	59	12	14
AJT-40	10.4		22.78	64.79	12.44	2.25	12.1	2.60	0.036	6.960	1.400	1.608	1.580	0.0033	0.0042	0.0025		13	64	6	17
AJT-43	14.0		17.83	45.66	36.52	0.60	11.8	3.00	0.042	5.920	2.604	1.144	1.792	0.0041	0.0058	0.0030		9	67	10	14
HB-1	3.2		12.05	66.86	21.09	1.13	2.4	3.21	0.058	1.280	2.010	1.194	1.620	0.0038	0.0042	0.0032		22	52	7	19
HB-2	3.0		68.11	20.95	10.94	0.67	7.8	2.50	0.051	0.496	1.388	0.865	2.520	0.0028	0.0025	0.0025		30	40	12	18
HB-3	3.0		96.21	1.56	2.23	0.17	0.9	2.65	0.029	0.820	0.568	0.604	1.600	0.0018	0.0015	0.0007		19	54	7	19
HB-4	3.0		15.25	71.18	13.57	1.40	2.4	3.65	0.051	1.280	1.004	1.491	1.924	0.0043	0.0061	0.0033		24	50	7	19
HB-5	3.0		95.91	2.78	1.31	0.15	1.2	3.10	0.051	2.380	1.004	1.180	2.176	0.0036	0.0045	0.0025		14	61	7	17
HB-6	2.8		6.08	80.13	13.79	1.15	3.1	2.50	0.050	5.880	1.160	0.888	1.444	0.0029	0.0029	0.0027		29	46	6	19
HB-7	2.3		14.85	78.01	7.13	0.80	9.6	2.20	0.032	0.808	0.508	0.537	1.420	0.0018	0.0016	0.0013		21	52	5	22

NOTE: SMT: Smectite; ILT: Illite; KLT: Kaolinite; CLT: Chlorite

Table 5.—Average abundances of elements and ratios in deltaic and marine sediments, north arctic Alaska. All elemental abundances are expressed as wt. %.

Chemical Component	Delta	Nondeltaic Shelf (<64m)*	Extrashelf (>64m)*
Corg	0.72	0.95	1.19
$CO_3^=$	8.51	4.80	2.75
Fe	2.11	3.57	3.52
Mn	0.03	0.03	0.09
Ca	5.29	0.42	0.22
Mg	1.28	2.22	1.73
Na	1.47	1.59	1.97
K	1.04	2.30	2.03
Rb	0.0035	0.0097	0.0084
Li	0.0027	0.0047	0.0043
Co	0.0029	0.0029	0.0028
Cu	0.0031	0.0057	0.0059
Mn/Fe	0.02	0.01	0.02
Na/K	1.41	0.69	0.97
Ca/Mg	4.13	0.19	0.13

*After Naidu and Hood (1972)

Table 6.—Correlation coefficients for chemical, textural and clay mineral compositions of deltaic sediments, north arctic Alaska.*

	Depth	Sand	Silt	Clay	Corg	$CO_3^{=}$	Fe	Mn	Ca	Mg	K	Na	Li	Rb	Cu	SMT	ILT	KLT	CLT
Depth	1.000																		
Sand	–	1.000																	
Silt	-0.406	-0.915	1.000																
Clay	–	-0.624	–	1.000															
Corg	–	-0.569	0.578	–	1.000														
$CO_3^{=}$	–	–	–	0.387	–	1.000													
Fe	–	-0.508	0.478	–	0.406	–	1.000												
Mn	–	-0.420	0.402	–	0.350	-0.333	0.658	1.000											
Ca	–	–	–	0.371	–	0.763	–	–	1.000										
Mg	0.374	-0.399	–	0.638	–	0.329	–	–	–	1.000									
K	–	-0.578	0.424	0.563	0.478	–	0.647	0.528	–	0.566	1.000								
Na	-0.371	–	–	–	–	–	0.545	0.655	–	–	0.471	1.000							
Li	–	–	0.549	0.541	0.513	–	0.876	0.733	–	0.454	0.836	0.531	1.000						
Rb	–	-0.588	0.449	0.538	0.403	–	0.739	0.572	–	0.478	0.869	0.498	0.877	1.000					
Cu	–	–	–	–	–	0.380	–	–	0.433	0.334	0.473	–	0.410	0.376	1.000				
SMT	–	–	0.345	-0.343	–	-0.572	0.411	0.505	-0.668	–	–	–	–	–	–	1.000			
ILT	–	–	–	–	–	0.465	–	-0.436	0.540	–	–	–	–	–	0.383	-0.798	1.000		
KLT	–	–	–	–	-0.340	–	–	–	–	–	–	–	–	–	–	–	–	1.000	
CLT	–	–	–	0.471	–	–	–	–	–	–	–	–	–	–	–	–	-0.488	–	1.000

NOTE:* Only figures that are significant at 95% confidence level (r = 3.325) cited in the table.
SMT: Smectite, ILT: Illite, KLT: Kaolinite, and CLT: Chlorite

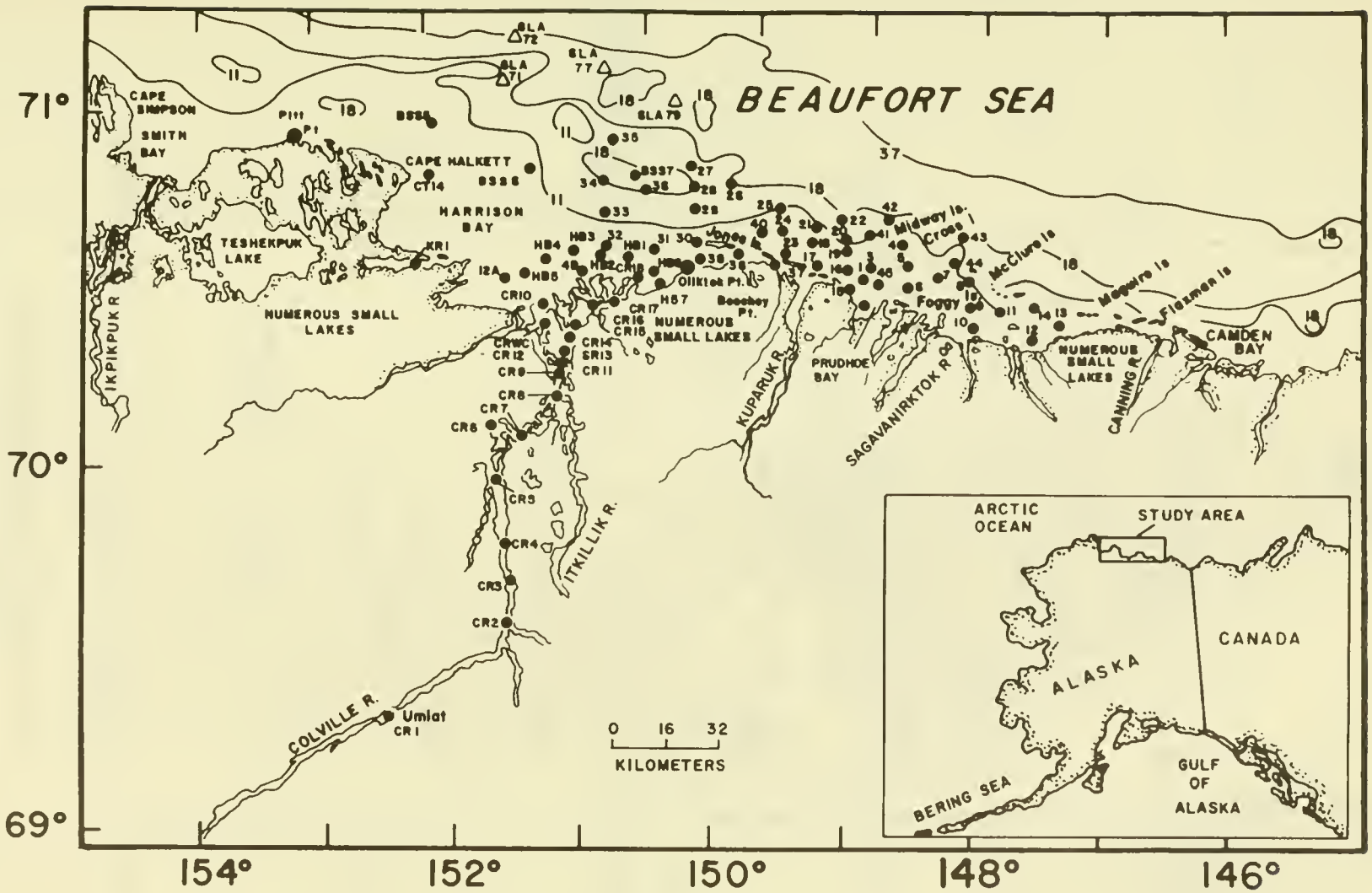

Figure 1.—Index map showing the area of study and locations of sediment samples. All sample locations except 12A, 4B and HB-Series, depicted by solid black dots have a prefix AJT. The depth contours are in meters.

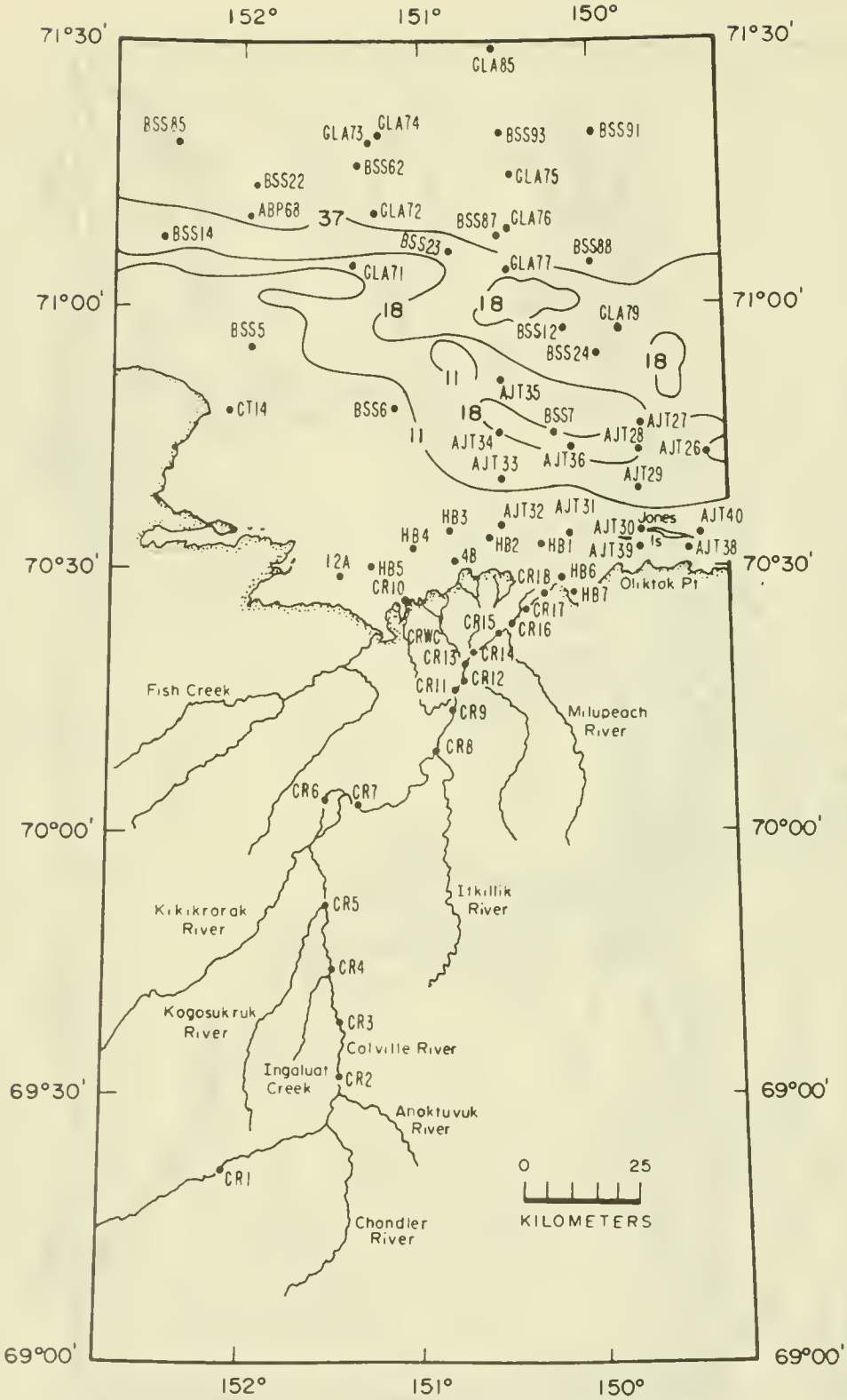

Figure 2.—Map of Colville Delta showing sample locations. The depth contours are in meters.

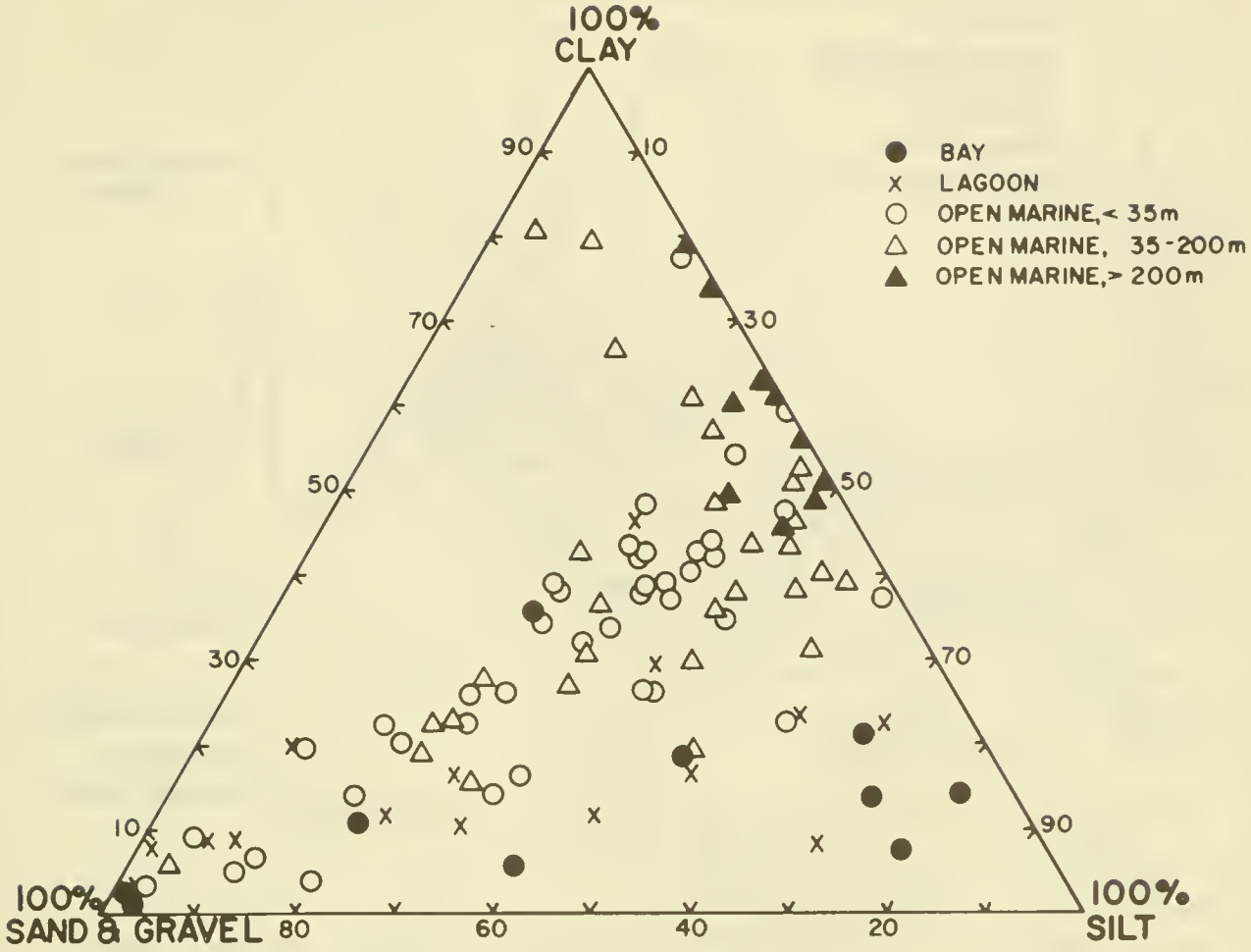

Figure 3.—Gravel-sand, silt and clay plots.

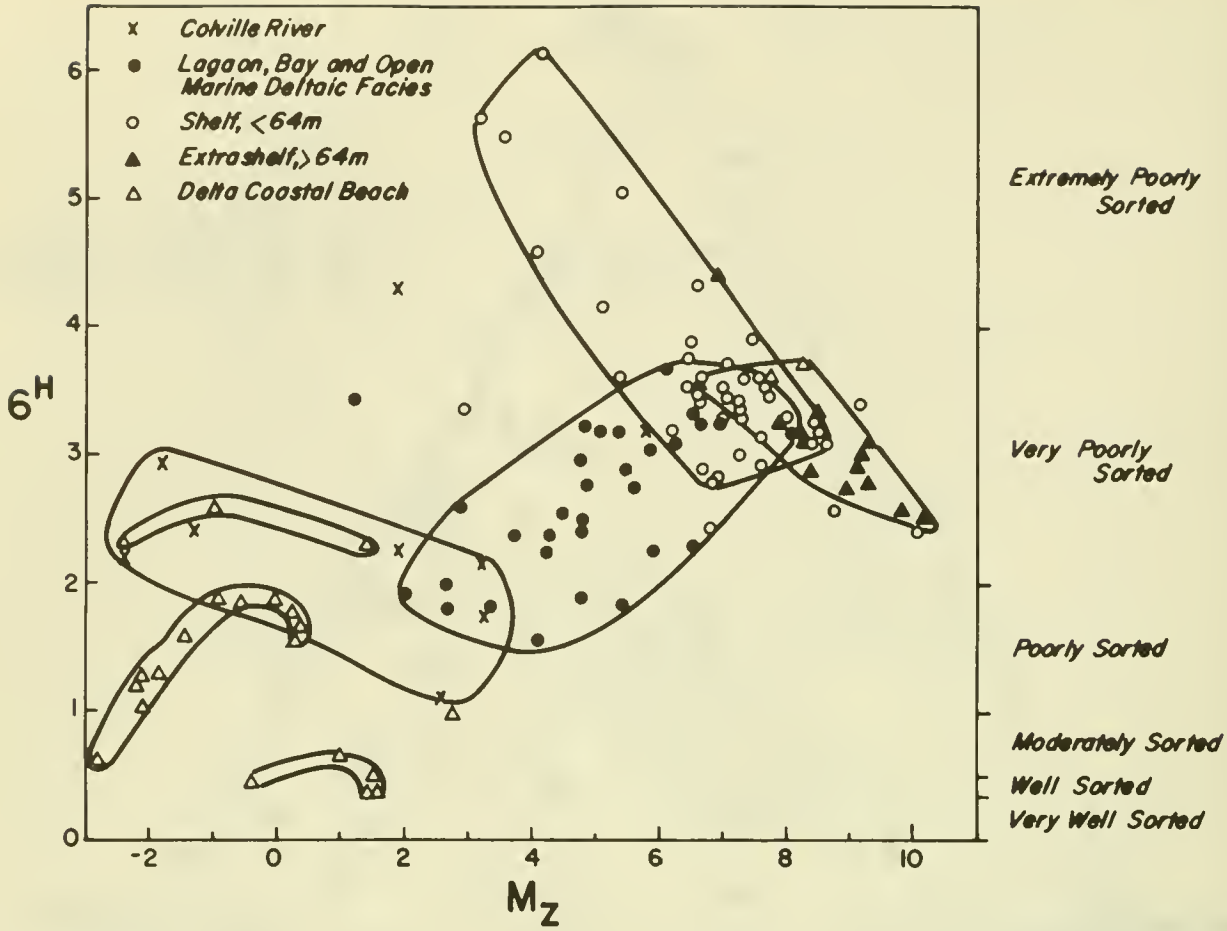

Figure 4.–Phi Mean Size (M_z) versus Sorting (σ_z) plots of sediments. Data for the delta coastal beach and the Colville River environments were taken from Dygas et al. (1971).

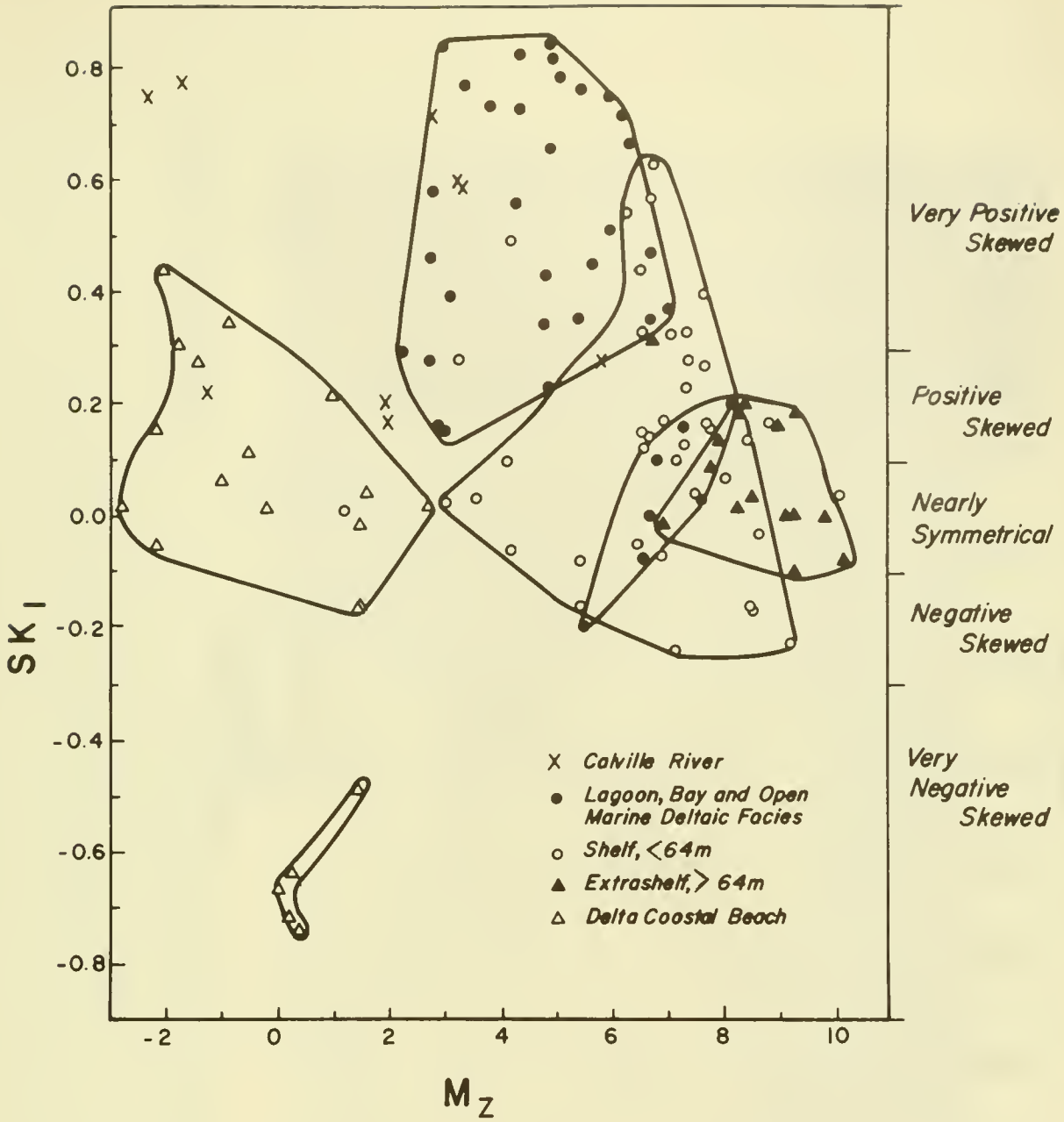

Figure 5.–Phi Mean Size (M_z) versus Skewness (Sk_z) plots of sediments. Data for the delta coastal beach and the Colville River environments were taken from Dygas et al. (1971).

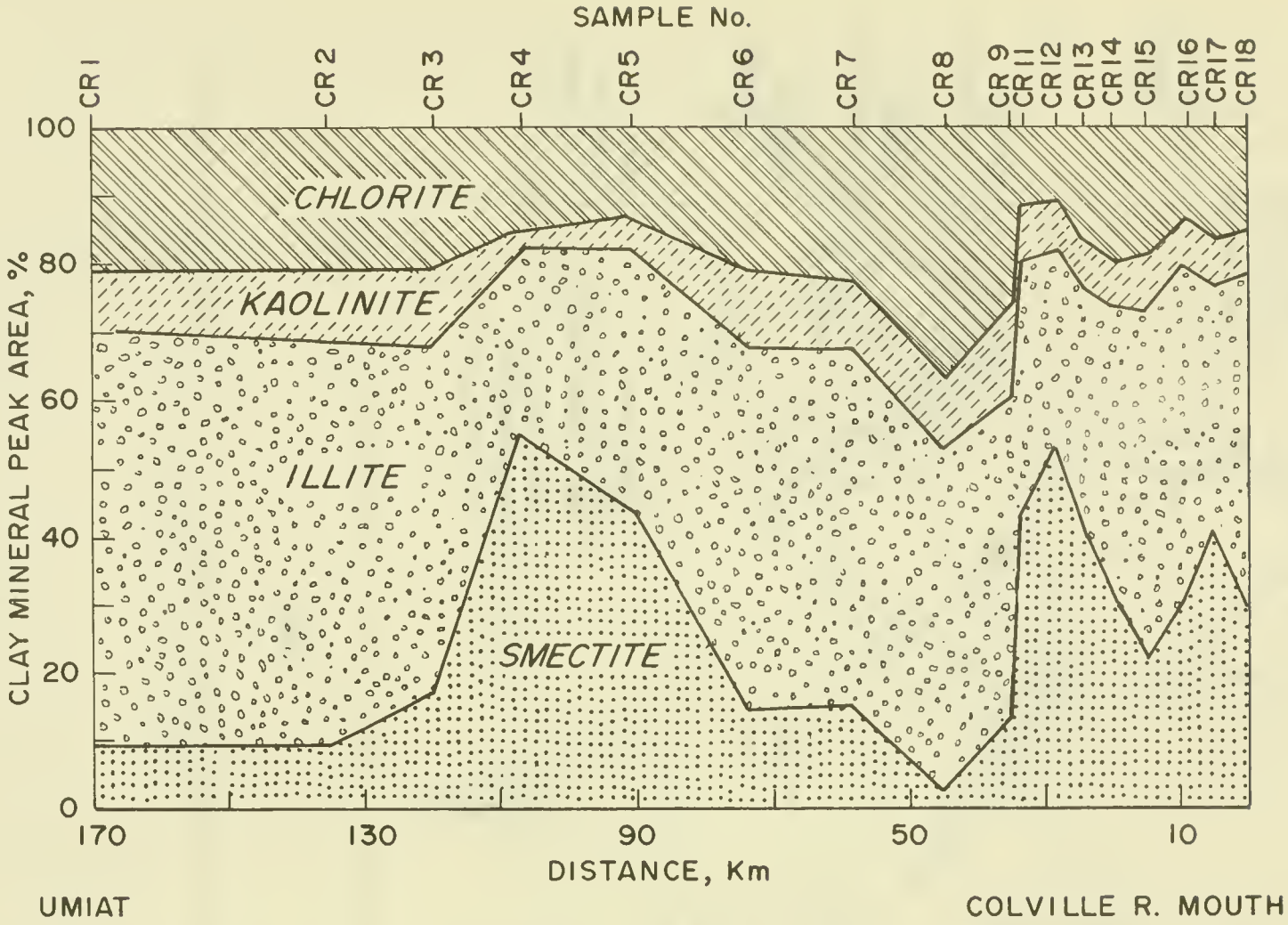

Figure 6.—Variations of clay mineral assemblages in the Colville River.

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